A MANUAL OF TREATMENT
—OF—
THE VENEREAL DISEASES

CIVILIAN EDITION

STATE DEPARTMENT OF PUBLIC HEALTH
DIVISION OF SOCIAL HYGIENE
SPRINGFIELD, ILLINOIS

THE VENEREAL DISEASES

An Outline of Their Management, Prepared Under the Direction of the Surgeon General of the Army for the Use of Medical Officers

REVISED FOR USE OF CIVILIAN PHYSICIANS

THIRD EDITION

PRINTED FOR THE

UNITED STATES PUBLIC HEALTH SERVICE

RUPERT BLUE, Surgeon General.

Chicago
American Medical Association, 535 North Dearborn Street
1919

This Manual, setting forth the latest scientific and approved methods of treatment of Venereal Diseases, is presented to members of the medical profession of Illinois with the compliments of the State Department of Public Health.

Members of the profession are invited to avail themselves of the free Laboratory service of this Department in the diagnosis of cases under their care or observation. Outfits for the collection and forwarding of specimens can be obtained at any State Antitoxin Agency.

C. ST. CLAIR DRAKE, M.D.,
Director of Public Health.

Previous editions of this manual have been printed to the amount of 38,000 copies. This edition, 70,000 copies.

PRICE 25 CENTS

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AMERICAN MEDICAL ASSOCIATION

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PRELIMINARY NOTE

This manual was originally prepared for the use of the Medical Department of the Army. It has been adopted by the Surgeon-General of the Public Health Service, for distribution to civilian physicians. Very few modifications have been found necessary. A chapter on gonorrhea in women has been added, for which thanks are due to Dr. N. Sproat Heaney, Assistant Professor of Gynecology, Rush Medical College, Chicago.

The purpose of this manual is to give definite instructions in approved methods of treatment of the venereal diseases, to the end that the reader may easily inform himself in them without being confused by a multiplicity of details. It is believed that the articles are sufficiently full to cover the essential facts. Descriptions of complicated procedures, requiring special trained skill for their carrying out have intentionally been omitted; cases requiring treatment of this sort should be referred to a trained urologist.

It is the impression of the committee that what the profession of the country most lacks in the treatment of venereal diseases is, not general information as to the treatment of these diseases, but precise knowledge of the most approved methods and plans by which this treatment is carried out. It is the particular aim of the manual to supply this sort of knowledge.

INTRODUCTION

The war has made it possible and necessary for venereal diseases to receive the attention that they deserve, from health authorities, from physicians and from the general public. The government is devoting an immense amount of money and labor to the control of these diseases. The "Program of Attack on the Venereal Diseases" (see Appendix) is being followed with the greatest determination by the War Department. The result is that the incidence of new cases of venereal diseases in our army is much less than half of what it ever was before this war.

During the year ending Sept. 15, 1918, the records of the office of the Surgeon-General of the Army show that a total of 169,325 cases of venereal diseases were treated in our army. Of this number, approximately one sixth were acquired after the men entered the army camps; the remaining five sixths were brought in from civilian life. It is not necessary to elaborate on the fact of how common has been this burden on the Army. The Navy, too, has carried a similar burden of venereal disease.

In addition, the venereal diseases have hindered war preparations by reducing the output of munition plants

and other factories, coal mines, shipyards, etc. These diseases among the civilian population have, therefore, been of the greatest importance in relation to the winning of the great war, and this military importance has demanded that the utmost efforts be made immediately to reduce their prevalence. In addition, the general public has been educated to the stern necessity of combating venereal diseases in times of peace as well as of war; for these statistics of the draft boards have given indisputable evidence of the alarming prevalence of these diseases throughout the civilian population.

The prevention of these diseases, in the ways indicated in the "Program of Attack" (pages 143 to 152), is a task resting largely on the civilian physicians, as well as on those forces that make for good government, high moral standards, and the proper training of our youth. The physician bears the responsibility for the strictly medical efforts of prevention, the responsibility for making an accurate diagnosis in each case as it presents itself, and for giving the patient thorough treatment and instruction; and he bears the further responsibility for reporting each case to the health authorities, and for otherwise faithfully observing the laws of his state with regard to the prevention of the venereal diseases.

REPORTS OF VENEREAL INFECTIONS

Cases of syphilis, gonorrhea and chancroid are to be reported to the health authorities in accordance with state or local laws and ordinances. The source of the patient's infection, namely, the individual from whom he or she contracted the disease, should be ascertained if possible, and the patient instructed to advise that person to seek treatment. Where persons are wilfully and negligently spreading the disease to others, report of that fact should be made to the proper authorities.

INSTRUCTION OF PATIENTS

Each patient is to be thoroughly instructed in the nature of his disease, its means of spread, and the necessity of continuing treatment until cured. Verbal instruction by the physician is most important. Printed instructions (see Appendix, pages 153 to 159) will also be furnished free of charge by the state or municipal board of health in many states. When not otherwise obtainable, they will be sent on request by the Division of Venereal Diseases, United States Public Health Service, Washington, D. C.

LABORATORY EXAMINATIONS

The diagnosis of syphilis is to be confirmed by the Wassermann test, and that of gonorrhea by microscopic examinations, whenever possible. These examinations are made free of charge by many state or city

boards of health. Where this is not the case, it is strongly recommended that the physician arrange to have these examinations made for him by a thoroughly qualified laboratory.

PREVENTION OF INFECTION

It is the duty of the physician to urge continence in unmarried individuals, not only as the surest means of preventing venereal infections, but also because the best interests of the individual and of the race demand a clean life. It should be pointed out to such persons that clean thinking, the selection of the best type of associates, active employment, and outdoor sports and other wholesome recreations, render the control of the sex impulse possible, even for those persons who previously have not practiced continence (see Appendix, "Program of Attack," pages 143 to 152). Young men especially should be sympathetically taught and encouraged to exercise self-control and live continent lives.

In the case of persons who have failed to do this, and have exposed themselves to venereal diseases, humanity demands that every effort should be made to prevent these serious infections from developing. Such persons should consult their physician immediately, in order to receive the early (prophylactic) treatment within an hour after exposure. (See Appendix, pages 147 to 149.)

PROPHYLAXIS OF VENEREAL DISEASES

The importance of social and educational measures tending to reduce the prevalence of the venereal diseases is to be strongly emphasized. Such measures as applied successfully in the Army are referred to under "Program of Attack on Venereal Diseases," (pages 146-147). The various measures there mentioned might well be put into effect in every city and town, with certain modifications which will suggest themselves to make them apply in civilian communities.

In addition, methods of medical prophylaxis are also of the highest importance in cases where they can be scientifically applied. Every extramarital intercourse is to be regarded as an exposure to venereal infection, and this infection should if possible be prevented from development. The so-called prophylactic treatment is really early treatment, applied to the venereal diseases in their earliest stage, before the infecting organisms have penetrated into the tissues.

Such treatment is very efficacious in preventing the development of venereal infection if given within the first hour after exposure. Its value rapidly diminishes from then on, and when eight hours have elapsed since

the exposure its value is greatly reduced. It should, however, be given up to at least twelve hours after exposure. Cases applying at a later time than this should be instructed simply to bathe thoroughly with soap and water, and in the case of females also to take a douche. All persons giving a history of exposure should report to their physician for examination every second day for ten days, and after that weekly for two months, in order that any infection may be detected at the earliest moment, and they themselves should be instructed to watch for suspicious symptoms. Patients should not have sexual intercourse during the time that they are under observation.

ADMINISTRATION OF EARLY OR PROPHYLACTIC TREATMENT TO MALE PATIENTS

Have the patient urinate.

Wash genitals and adjacent parts with soap and water, followed by a 1-2000 mercuric chlorid solution. Dry the parts thoroughly.

Inject a 2 per cent. protargol solution, or a 10 per cent. argyrol solution, or an equivalent solution freshly made, into the urethra, enough to distend it moderately, and see that the patient holds the solution for five minutes before expelling it.

Anoint the whole of the penis and scrotum with 33 per cent. calomel ointment, rubbing in thoroughly, using special care about the folds of the frenum, foreskin, and scrotum, and taking at least ten minutes for the operation. Cover genitals with oiled silk or waxed paper, and allow to remain for several hours before washing the parts.

The formula for calomel ointment used in the United States Army, which has proved its efficacy, is as follows:

	Parts
Hydragyri chloridum mite.....	30
Adeps benzoinatus.....	65
Cera alba, U. S. P.....	5

ADMINISTRATION OF EARLY OR PROPHYLACTIC TREATMENT TO FEMALE PATIENTS

In cases of rape, and in some others, there may be occasion for applying early treatment to females. If such occasion should arise, the following procedure is suggested:

Have patient urinate.

Place patient in lithotomy position. Wash the genitals and adjacent parts with soap and water. Give a douche of two quarts of sterile water, temperature 100 F., followed by two quarts of 1-2000 mercuric chlorid

solution, and wash external parts with the latter. Dry vagina and vulva by sponging. Swab entire vagina, through a speculum, with a 2 per cent. protargol solution, or 10 per cent. argyrol solution, freshly made; reach every fold and especially the posterior vault and external os. Swab entire vulva in the same way, reaching every recess and endeavoring to facilitate the entrance of the solution into the openings of Skene's ducts and Bartholin's glands. Inject enough of the same solution into the urethra to distend it moderately and let patient hold her finger (in a rubber glove) against the meatus to retain the solution for from three to five minutes.

Douche vagina and vulva with a small amount of sterile water, and sponge dry. Apply calomel ointment to the cervix, vagina, vulva and adjacent parts, rubbing thoroughly into the recesses and folds of the mucous membranes and skin, and taking at least ten minutes for the operation. Do not use more than 4 gms. (1 dram) of calomel ointment in vagina. Cover external parts with oiled silk or waxed paper and instruct patient to allow ointment to remain for several hours before washing the parts.

THE DIAGNOSIS AND TREATMENT OF SYPHILIS

CASE RECORDS

Great importance is attached to the keeping of systematic and full histories of venereal cases. The proper treatment of syphilis requires that an accurate record be kept in each case.

All infectious cases should be reported promptly, according to law, and all patients should be given instructions concerning their disease (see Appendix).

IMPORTANCE OF EARLY DIAGNOSIS

From the standpoint of public health, early diagnosis is of the greatest importance. The matter of prime importance in handling syphilis is to get it at the beginning of the infection. The earlier it is treated the better are the prospects of cure, and the quicker the patient can be made noncontagious and fit to work. It should be the constant effort to discover syphilis at the earliest possible time, if possible before the development of a positive Wassermann reaction.

To this end, every sore, whether on the genitals or elsewhere, that is open to any suspicion of being a chancre, should be repeatedly examined for spirochetes. No determining weight should be given to

the so-called specific clinical characteristics of any lesion that might by any possibility be a chancre. Experience has shown that the typical clinical characteristics of the chancre, aside from indolence—and this may be masked by another infection—are often lacking. Any excoriations, papule, nodule, crack, herpetic or other erosion, no matter how small, may be an initial lesion of syphilis; and such lesions, as well as ulcers about the genitals—and elsewhere, if there is any reason to suspect them or if they are indolent and not readily to be accounted for—should be searched for spirochetes.

Chancroids in particular should never be accepted as uncomplicated by syphilitic infection. They are likely to have a double infection, and should always be zealously examined for *Spirochaetae pallidae*. Sometimes, in spite of the most careful search, the spirochetes escape detection in chancroids. For that reason, one can never be sure that a chancroid does not hide a chancre; patients with chancroid, therefore, require watching for the possibility of syphilis, and, when the spirochetes cannot be found, should always have weekly Wassermann tests for three or four weeks until the question of syphilis can be decided.

Antiseptics, especially mercurials, render the finding of *Spirochaetae pallidae* difficult or impossible;

and, because of this, it should be routine practice to apply no mercurial dressings, or better, no antiseptic dressings, to suspicious lesions until the necessary examinations to exclude *Spirochaetae pallidae* have been made. If any such application has been made to a suspected lesion, the lesion should be thoroughly irrigated with physiologic sodium chlorid solution, and a wet dressing of this solution applied for twelve hours or more before examining for spirochetes.

In order to aid in discovering the initial lesion at the earliest moment persons who have been exposed should be examined at intervals of a few days for at least three weeks, and also instructed to be themselves on the watch for suspicious lesions.

EXAMINATION FOR SPIROCHAETAE PALLIDAE AND DIAGNOSIS

To obtain the *Spirochaetae pallidae* for examination, two procedures are of value. In obtaining them directly from the lesion, the surface should be wiped with gauze wet with physiologic sodium chlorid solution, to remove saprophytic organisms, especially the *Spirochaeta refringens*. The rubbing should leave a clean oozing surface, no bleeding. Light curettement may be necessary in some cases. Moderate squeezing of the lesion will then cause an exudation of lymph

from the deeper portions of the tissues. A drop of this lymph is then touched to a cover-glass and placed on a slide, or the fluid may be collected in a capillary pipet. It may be preserved for a few hours by sealing the pipet, or the specimen on the slide may be ringed with paraffin or petrolatum and kept on ice for variable periods up to twelve hours or longer. Delay impairs the validity of the findings, however, and multiplies uncertainties, so that examination should be made at once.

A valuable method, which relieves the observer of much of the responsibility for differential diagnosis of the organism, is glandular aspiration. This can be done on prominent nodes in the satellite adenopathy accompanying the primary lesion. It can also be performed on the indurated base of a suspected chancre. A sterile glass syringe, of 1 c.c. capacity, fitted with an ordinary stout hypodermic syringe needle, an inch or so in length, is sufficient. The skin over the gland is painted with iodin, and the gland palpated and fixed between the thumb and forefinger of the left hand. The needle is plunged through the skin into the gland, the penetration of the capsule being indicated by the moving of the gland under the finger when the position of the syringe is changed. The gland is then held

firmly while the needle is manipulated enough to macerate the tissue immediately around the point. Aspiration will draw a drop or two of tissue juice into the needle and barrel. The fluid thus obtained is often rich in *Spirochaetae pallidae.* The method is not especially painful, and is easily borne by the average patient.

The *Spirochaeta pallida,* as obtained for study by these methods, has a morphology usually easily recognized by the experienced observer. It is a regular spiral organism, of from 6 to 15 microns in length, with from 3 to 26 turns. The average length is about twice that of a red blood cell, and the usual number of turns is from 10 to 20. It is rather slow moving, which is a distinctive characteristic. A movement in the direction of the long axis and a rotating movement are most commonly observed. The organism retains its clear-cut, regular spiral turns exceptionally well, even at rest—another distinctive characteristic. Long forms bent in the middle are occasionally seen.

From *Spirochaeta refringens,* if this is not eliminated by proper cleansing, the *Spirochaeta pallida* is distinguished by the fact that *Spirochaeta refringens* is obviously coarser, and the turns are fewer and less regular. *Spirochaeta refringens* does not keep its cork-

screw shape so well as *Spirochaeta pallida* when at rest, and when in motion moves much more rapidly than the *Spirochaeta pallida.* *Spirochaeta dentium,* seen in mouth preparations, is much more minute than the *Spirochaeta pallida.* The coils are more acute and more lightly rolled. Fibrin spirals have been mistaken for syphilitic spirochetes by inexperienced observers. In general it may be said that while the recognition of the organism of syphilis is not an affair for the tyro, a moderate amount of experience on the part of the examiner, coupled with the presence of numerous organisms of the above described type in a given preparation made under favorable conditions, is sufficient for a diagnosis of syphilis and the institution of appropriate treatment. Failure to find them, however, is no evidence that the lesion is not syphilis.

In all suspected cases, Wassermann tests should be made. It should be made a general rule that the first finding of a positive Wassermann reaction should immediately be confirmed by a second; but it is not necessary to delay beginning treatment until the second report is received. For the first ten days after the appearance of the chancre, the Wassermann reaction is usually negative. It is at this critical period that the establishment of the diagnosis of syphilis by demonstration of the specific spirochetes is of such

importance, because it enables us to begin treatment while the infection is still relatively localized and can usually be aborted by thorough treatment. In suspected chancres in which spirochetes cannot be found, Wassermann tests should be made at intervals of a week, for a month, before it is decided finally that the case is not syphilis. In cases in which the spirochetes are found, a Wassermann test should be made at the outset, and if it is not positive, should be repeated at weekly intervals for the first few weeks to see if, in spite of treatment, it becomes positive. Further Wassermann tests should be made at about monthly intervals.

In no case should specific treatment be started until a positive diagnosis of syphilis has been made.

TREATMENT OF THE CHANCRE

Excision of the chancre is a procedure which theoretically should be useful, on the ground that it removes the important focus of infection. And when the location of the chancre is such that its excision will not cause deformity, surgical excision may be done; but excision of the chancre does not abort syphilis. The excised chancre should be preserved and sent for laboratory examination. Until the search for spirochetes is ended, the chancre should be treated

only by cleansing with saline solution and covering with a compress wet with the same solution. As soon as spirochetes are demonstrated, if the chancre is not excised, it should receive an inunction of 33 per cent. calomel ointment twice daily for a week; it should be kept clean and protected by a calomel ointment or some bland protecting dressing.

SYSTEMIC TREATMENT

In the presence of early syphilis treatment should be immediately started and vigorously pushed. It should be with both arsphenamine and mercury. Before beginning there should be a preliminary survey of the patient's physical condition. Patients with acute febrile diseases or with diseases of the liver, kidney or vascular system—when they are nonsyphilitic in origin—should be given arsphenamine with caution.

ARSPHENAMINE [1]

There is agreement among syphilographers that the most effective time for producing radical results with arsphenamine is in the first few weeks of syphilis—

1. Arsphenamine is the official name now applied to the drug formerly called salvarsan. The various special names, such as arsenobenzol, diarsenol and salvarsan, are proprietary names and should not be used unless to designate the particular brand. In records the name arsphenamine should be used, and the special name or the manufacturer's name also given.

best before the Wassermann test becomes positive—and that arsphenamine should be pushed at this time.

The normal dose should be on the basis of 1 decigram of arsphenamine for each 30 pounds of body weight, i. e., from 4 to 6 decigrams for patients of ordinary weight. The first dose should be one-half the normal dose. Administer at intervals of from five to seven days. Six doses constitute a course.

It is possible that in cases seen before the Wassermann test has become positive, one such course of arsphenamine combined with mercury may cure. But this is not safe to assume, and, in the light of our past knowledge of syphilis, it is advised even in these cases to repeat the course of arsphenamine and mercury treatment at least once after a rest period of from six to eight weeks. Such patients should be subsequently watched for a year with monthly Wassermann tests and treated, should any evidence of syphilis be discovered.

In all cases seen after the Wassermann test has become positive the first course of treatment should be followed by a second after four to six weeks' rest. And it is safest to give at least a third similar course after an interval of two months even in the most promising of cases.

In all those cases in which a positive Wassermann test or any other evidence of syphilis remains, further courses of arsphenamine and mercury should be given at intervals similar to the foregoing, the persistence in treatment to be determined by the findings in the individual case.

In place of arsphenamine, neoarsphenamine can be used in 50 per cent. larger doses. It may be somewhat less effective, but the difference is not sufficient to allow of dogmatic statements on this point.

It may be repeated that the use of arsphenamine is to be combined with that of mercury in the attempt at cure of syphilis; and that reliance is not to be placed on arsphenamine alone.

PREPARATION AND CARE OF PATIENT

The urine should be examined before each injection of arsphenamine. Arsphenamine should be given with the patient's stomach empty, or nearly so. The treatments are best given at noon or in the early afternoon, the patient omitting lunch. He should remain quiet for the rest of the day—best in bed—and should take no food until the next morning.

REACTIONS FROM ARSPHENAMINE

As a rule the administration of arsphenamine is followed by no symptoms whatever. Occasionally,

however, reactions occur from it; these vary in severity from slight, evanescent distress to symptoms of the gravest poisoning.

To some extent, perhaps, these reactions are due to individual hypersensitiveness to the drug. There is good reason to believe, however, that the severe reactions are chiefly produced by impurities in the drug, due to faults in manufacture, or sometimes to oxidation produced by carelessness in technic of administration.

The reactions may be divided for consideration into early and late; the early reactions occurring from the very time of injection to six or eight hours afterward, and the late occurring from one to four or five days, and, occasionally, even longer afterward.

The early reactions have the symptoms of acute poisonings; the late, symptoms of organic disturbances that have resulted from the slower action of a poison.

EARLY REACTION

Nausea: The commonest reaction after arsphenamine is a feeling of malaise with some nausea from five to seven hours afterward. Not infrequently this amounts to a chill, followed by slight fever and more or less severe vomiting. These symptoms disappear in a few hours.

They do not constitute a contraindication to the further use of the drug, but they should suggest that more care than usual be exercised to see that, before administration, the bowels have been cleaned out and the stomach is empty and that, afterward, the patient rests without food until the next morning.

Febrile Reaction: Rarely these reactions are more severe. The temperature may go to from 38 to 40 C. (101 to 104 F.) with headache and general pains, especially of the legs and back, diarrhea as well as nausea and vomiting, and an eruption of urticaria or toxic erythema. The treatment is rest in bed and a liquid diet until symptoms have subsided. The pain may be controlled by a few doses of salicylates. No more arsphenamine should be given in these cases until several days after all symptoms have disappeared, and any further administration of the drug should be in relatively small doses and at intervals of not less than a week.

Temporary Albuminuria: It is not uncommon to find a trace of albumin and a few casts in the next morning's urine after an injection of arsphenamine. This is not a contraindication to the further use of the drug unless the albumin is present in considerable quantity and there are more than half a dozen casts to the slide.

Immediate Acute Reaction: The early reaction which in rare cases accompanies or immediately follows the administration of arsphenamine is that of an acute poisoning, characterized by intense congestion from vasomotor disturbances; this is the so-called anaphylactoid reaction of arsphenamine. It is probably due to impurities in the drug. In these cases the patient suddenly—perhaps before the injection is finished—manifests symptoms of distress. He may first notice a taste of garlic or ether, or of a metallic substance. An erythema appears on the neck and spreads thence over the face, and the jugular pulse is exaggerated and rapid. He complains of faintness; the pulse becomes weak and the respiration labored. The face is puffed and congested; the pupils dilate; there is a feeling of constriction in the throat; and there may be edema of the glottis, which fortunately is very rarely fatal. There is tightness in the chest, and especially precordial distress. The pulse may become imperceptible, the patient cyanotic, and syncope may occur. Altogether the picture is extremely alarming in the severe cases, but fortunately the symptoms as a rule quickly improve, and recovery nearly always takes place.

These cases promptly respond to the injection of from 1 to 2 c.c. of 1 : 1,000 solution epinephrin (adre-

nalin), which may be repeated at intervals of twenty or thirty minutes, if required, until the symptoms subside. In preparation for this emergency a sterile hypodermic syringe with 2 c.c. of epinephrin solution in it should always be at hand when arsphenamine is given.

The occurrence of this reaction does not preclude the further use of arsphenamine; but it suggests that careful control of the patient's preparation should be exercised, that the technic should be reviewed, and that the preparation of arsphenamine should be investigated.

LATE REACTIONS

Lowering of General Health: Occasionally during a course of arsphenamine a patient's general health becomes lowered without other evidence of organic disturbance. There is lassitude and, perhaps, headache. The appetite is poor and he falls off in weight. Such symptoms — likely to be overlooked because of their insidiousness—should lead to careful consideration of the case. Patients who are doing well under specific treatment show it in an improvement in their general well-being. If this lowering of the health progresses under arsphenamine, it should be discontinued. The patient should

stop work, be placed on a liberal, perhaps forced, diet, given tonics, and his elimination stimulated by abundance of water and the use of laxatives or cathartics. He should also be carefullly examined for other diseases.

Erythema and Dermatitis: In rare cases, patches of scarlatiniform erythema develop from twelve to twenty-four hours after arsphenamine; these are usually accompanied by evidence of kidney irritation. The appearance of areas of scarlatiniform erythema is an indication that arsphenamine should be stopped until well after these symptoms have disappeared, and that its further use should be very guarded.

These preliminary manifestations of intoxication usually disappear spontaneously in a few days, although rarely they develop into the severe cases. If arsphenamine is continued in spite of these warnings, there is likely to develop a universal exfoliative dermatitis with nephritis. In extreme cases the nephritis is severe, accompanied by high fever, diarrhea and bronchopneumonia, and the result may be fatal. The same measures, to a greater degree, are indicated here as already suggested for lesser intoxication—complete rest, support of the patient's strength by an abundant diet and stimulation of elimination.

Nephritis: Severe nephritis with its sequelae may occur without skin symptoms. For this reason the urine should always be carefully watched while arsphenamine is given.

As already suggested, a transient albuminuria with a few casts is common the next morning after an injection of arsphenamine. If this promptly disappears, it is not a contraindication to the continuance of the injections.

Again, albuminuria due to syphilitic nephritis is not very rare. The evidence of the characters of such an albuminuria is that it is quickly benefited by arsphenamine as by other specific treatment.

Persistent evidence of nephritis developing in the course of arsphenamine administration is another matter. It requires that the course be stopped and not resumed until the nephritis has disappeared; and then the further use of the drug must be with extreme caution. If these precautions are neglected the case is likely to develop into one of severe, permanently disabling, or fatal type.

Jaundice: In rare cases, jaundice occurs in the course of the use of arsphenamine. It is always a sign of serious intoxication and should cause immediate, careful attention to be given to the case. Such cases may go on to acute yellow atrophy of the liver

with fatal termination. They require in the way of treatment measures for overcoming intoxication of the sort already outlined. The larger proportion of jaundice cases are said to follow neoarsphenamine.

Hemorrhagic Encephalitis: This, fortunately, is one of the rarest, as it is one of the most serious of arsphenamine accidents. The cases begin from two to four days after arsphenamine with severe headache, mental confusion and dulness; then, usually, convulsions, coma, and death in a few days.

The pathology of cases succumbing from this type of arsenical intoxication shows as a rule the following features: There is characteristically an acute hemorrhagic encephalitis with softening of the cerebral tissue and with punctate hemorrhages, especially in the basal ganglia, pons and medulla, but also involving the cerebral lobes adjacent to the lateral ventricles and less frequently the cerebellar tissue. With this is associated an acute ependymitis, especially in the lateral ventricles with hyperemia and punctate hemorrhages. There may be general cerebral congestion and edema. Acute nephritis may be present but is not constant. Degenerative lesions may develop in the liver, sometimes giving a picture resembling acute yellow atrophy.

Treatment of these cases consists of vigorous elimination, which may include withdrawal of blood, and the intramuscular use of epinephrin in full doses.

Herxheimer Reaction: In the presence of syphilitic lesions in vital structures, the administration of arsphenamine which, presumably from the liberation of spirochetal endotoxins, causes a temporary engorgement of the syphilitic lesion, may produce serious symptoms of pressure, of obstruction or of other impairment of function. This reaction is most likely to occur with early cerebral lesions, producing pressure symptoms, which may cause paralysis, coma and even death. As a rule, while the symptoms are alarming, recovery takes place.

Similar reactions, producing symptoms of a character dependent on the location of the syphilitic focus, may occur with syphilitic lesions of the viscera, or of the circulatory system, particularly in myocarditic coronary arteritis, and aortitis.

To guard against these accidents, when there is reason to suspect lesions in any of these structures, particularly in the brain, mercury and iodid should be vigorously given for several days before arsphenamine is started, if the symptoms are not so urgent as to warrant taking the risk of a Herxheimer reaction, and then the use of arsphenamine should be cautiously

begun, with small doses, and only after two or three injections should full doses be given.

In these reactions, treatment is symptomatic.

In general, the careful man is likely to attach undue importance to minor symptoms arising in the course of arsphenamine administrations, and to be influenced too readily by them to give up its use in the particular case. On the other hand a reasonable caution in the face of symptomatic warnings of arsphenamine intoxication demands care in its further use in such cases.

NEURORECURRENCES

It is an occasional experience to see, with patients who have had insufficient treatment with arsphenamine or mercury, a recurrence of syphilis in a nerve or the brain or cord, producing symptoms of impairment of function in the particular structure involved. These recurrences are most likely to be observed in the auditory or optic nerves, producing more or less damage to hearing and vision. While these are mentioned here, they are not manifestations of arsphenamine poisoning. They are due to syphilitic infiltrations and occur, as well, in patients who have had no arsphenamine. They require vigorous specific treatment, with mercury, iodid, and arsphenamine — especially the

latter in patients who have already had arsphenamine. Of course, when these recurrences are cerebral as in the case of involvement of the optic nerve, due care must be exercised with arsphenamine to avoid a Herxheimer reaction.

TECHNIC OF ARSPHENAMINE ADMINISTRATION

The fundamental principle of administering any form of arsphenamine is a rigid asepsis, and only extreme conditions justify its administration when this is not obtainable. The apparatus should be boiled for twenty minutes. It is important that freshly distilled water be used for arsphenamine solution. Thirty c.c. of water per decigram of arsphenamine is a safe dilution. The ampule should be sterilized by immersion in a strong antiseptic solution, such as mercuric chlorid, 1 : 1,000, and then should be immersed in 95 per cent. alcohol in order to be sure it is not cracked. If it has been immersed in mercuric chlorid it must be carefully wiped dry before it is opened. It must never be sterilized by boiling.

The drug is first dissolved in about 50 c.c. of water. The American preparation arsenobenzol of the Philadelphia Research Laboratories requires hot water for its solution, and is safely dissolved in hot water. The other preparations dissolve in water at room

temperature and should not be heated, because of the danger of the formation by heat of highly toxic compounds. The direct solution of arsphenamine is a strongly acid solution, which must be neutralized and diluted before injection. Neutralization is accomplished after all the arsphenamine is dissolved by a 15 per cent. freshly prepared solution of sodium hydroxid, which should be added drop by drop. Arsphenamine is precipitated from the solution by the alkali, but redissolves as soon as the suspension becomes slightly alkaline. The point at which this occurs can be gauged with sufficient accuracy if the sodium hydroxid is added carefully and mixed after each drop or two. Since arsphenamine oxidizes easily, it should not be violently shaken in preparation. As soon as the arsphenamine has redissolved, yielding a clear yellow solution, it may be filtered through wet sterile cotton in a funnel directly into a graduated container; then warm or cold distilled water is added to the proper dilution and to approximately body temperature. Care must be taken to fill the tube attached to the container with physiologic sodium chlorid solution and to expel all air bubbles before the arsphenamine solution is filtered into the container.

In the event that the arsphenamine precipitates somewhat on dilution, it may be redissolved by another

drop or two of the sodium hydroxid. If the preparation has been made too strongly alkaline, a drop of dilute hydrochloric acid may be added and the neutralization repeated. The drug should be administered promptly after preparation, and no more than enough for use on the patients to be treated at the time should be prepared.

The technic of injection of the solution is comparatively simple, and the older custom of making an incision to find the vein, with its resultant scarring, has been abandoned by skilful operators. A variety of needles has been proposed, but the Schreiber 18-gage with thumb guard and a proper adapter, or even a plain needle, will answer all purposes. In difficult cases a finer needle may make it much easier to get in the vein. The skin over the field of operation, preferably in the region of the large cubital veins, is sterilized as for a surgical procedure, but if tincture of iodin is employed it is desirable to remove it with alcohol in order that the vein may be more easily seen. The injection should be given with the patient lying down and the veins distended by encircling the arm with a tourniquet.

In nervous patients, local anesthesia may be used to advantage. The needle is pushed directly through the skin over or to one side of the vein and then intro-

duced into the vein. As soon as the blood returns freely through the needle, the adapter attached to the tube of the container is fitted to the shoulder of the needle, the *tourniquet is released,* and the injection begun by elevating the container about two feet. As a rule assistance is desirable, since the operator is occupied by keeping the needle in position in the vein. Failure to enter the vein is apparent by this method, before injection is begun, through the imperfect flow of blood through the needle. The saline solution contained in the tube allows sufficient warning of the infiltration of the tissues before the arsphenamine solution reaches the needle point. Various forms of apparatus which inject saline solution as a test before beginning the injection of the arsphenamine are not essential and are often complicated. A glass telltale in the rubber tube permits the operator to watch the progress of the injection. When the injection is completed, the lowering of the container below the level of the arm before the needle is withdrawn will aspirate a small amount of blood from the vein and prevent the escape of solution into the tissues.

Recent investigations have shown that the danger from intoxication with arsphenamine is much greater when it is administered in concentrated solution or is

injected rapidly. For this reason it should be used in weak dilution and slowly injected.

Infiltrates, if they occur, are usually trivial, provided the operator has been on his guard. The escape of arsphenamine into the subcutaneous tissues is indicated by a burning sensation, which the patient should be warned to report. The reaction which ensues when arsphenamine is injected around the vein is inflammatory, with induration and infiltration, and may, if severe, progress to a slough. Arsphenamine infiltrates should be treated by wet dressings, icebag, and after inflammatory symptoms subside, by massage and passive movement. An alarming degree or involvement may subside with practically no damage after several weeks or months. Thrombosis of the vein is an infrequent complication if the drug has been properly diluted, and should be treated on general indications.

THE TECHNIC OF NEOARSPHENAMINE ADMINISTRATION

The original administration of neoarsphenamine, in dilutions similar to those used with arsphenamine, has been greatly simplified by the injection of the dose in concentrated solution. In this procedure, the dose of neoarsphenamine is dissolved in 10 c.c. of freshly dis-

tilled sterile water at room temperature—*not hot water.* The solution is drawn up into an all-glass syringe and administered as an intravenous injection after the usual preparations. The method is rapid and extremely convenient, and its applicability to difficult cases is apparent.

The solution of neoarsphenamine, being already neutral, requires no addition of sodium hydroxid. Care must be taken to avoid infiltrates with the concentrated solution, but in general infiltrates with neoarsphenamin are apt to be less serious than those with arsphenamine.

MERCURY

For the cure of syphilis, arsphenamine and mercury should be combined, and at the same time with each course of arsphenamine a vigorous course of mercury should be given. *This should begin before or at the same time with or within a few days after the first dose of arsphenamine.*

A course of mercury should consist of nine or ten weekly injections of an insoluble salt, of from twenty-four to thirty injections of a soluble salt at two-day intervals, or of from forty to fifty daily inunctions of mercurial ointment. The administration of mercury either by inunction or by intramusclar injection is

effective; and in the selection of either method one may be properly influenced by considerations of convenience and practicability.

INUNCTIONS

If inunctions are used, it is necessary to see that they are properly performed. Patients cannot be trusted to give themselves inunctions; but they can very readily do it for each other by sitting one behind another and having each man rub the back of the man in front of him. From 4 to 8 gm. of mercurial ointment may be used for a daily inunction. It is desirable before the inunction to wipe off the area to be rubbed with alcohol or to wash it lightly with soap and water and dry. The ointment should be rubbed in slowly and gently with the palmar surface for twenty or thirty minutes, or until the ointment is practically absorbed. Any excess should be allowed to remain on the skin. After six inunctions, a day should be skipped and the patient allowed a bath.

In giving inunctions, hairy surfaces and the thin skin of joints should be avoided, and the same area should not be used often enough to produce dermatitis. The two sides of the back furnish the most tolerant areas. The sides of the abdomen and of the chest, and the inner surfaces of the thighs, the arms and the forearms may all be used.

INJECTIONS

For injections, the preferable insoluble preparations are mercuric salicylate or calomel in oil, or metallic mercury in the form of gray oil. Perhaps the best proportion for the salicylate or calomel suspension is 20 gm. (weight) in sterile olive oil or thin liquid petrolatum, enough to make 100 c.c. (volume). A good formula for mercurial oil (gray oil) is redistilled mercury, 20 gm.; chlorbutanol, 2 gm.; anhydrous lanolin, 30 c.c. and liquid petrolatum, enough to make 100 c.c.

The intramuscular dose of calomel, salicylate and metallic mercury are the same. These three preparations, being of the same strength, have the advantage of having the same dose. The average dose of either, for an adult man, is 5 minims (0.06 gm., 1 grain) weekly; by gradations the dose may be increased to 0.12 gm. (2 grains) weekly, or with caution even higher.

The curative action of the injection of soluble salts of mercury is perhaps less than that of the insoluble. However, they are free from the dangers of cumulative effect which are inherent in the insoluble salts; and in emergencies, when there is need to get prompt, certain and vigorous effect of mercury, they are of

great value. Mercuric chlorid, mercuric succinimid or mercuric benzoate are the most useful soluble salts for injections. Good preparations are 1 or 2 per cent. mercuric chlorid or 1 or 2 per cent. mercuric succinimid with 1 per cent. sodium chlorid by weight in distilled water. The average dose is 12 or 25 minims (0.015 gm., ¼ grain) into the muscle of the buttock every second day. Mercuric benzoate is given in 2 per cent. solution with 2.5 per cent. sodium chlorid, average dose 12 minims (0.015 gm., ¼ grain) every second day.

The American Expeditionary Forces use as routine treatment *intravenous* injection of 1 per cent. solution of mercuric cyanid. The average dose is 1 c.c. (16 drops), representing 0.01 gm. (⅙ grain) of mercuric cyanid, given daily.

TECHNIC OF INJECTIONS

For intramuscular injection, a syringe such as the all-glass Lüer hypodermic syringe with a 1½ inch, 20 or 22 gage needle is used. The needle should have a slip shoulder to permit of its easy detachment from the syringe. Sterlization of the skin with tincture of iodin is sufficient; emulsions once sterilized will remain so with reasonable care in their handling. In

military service the syringe and needle should be sterilized by boiling, or by liquid phenol, and the water or phenol removed by filling the syringe first with alcohol and then with ether.

The site of the injections is usually in the upper outer quadrant of the buttock, care being taken to avoid the region of the sciatic nerve or the structures about the hip joint. They can also be well given in the upper inner quadrant of the buttocks. Injections are made alternately into each buttock.

The needle with the syringe empty should be introduced to its full length, and the syringe then detached and filled with the necessary dose. This introduction of any empty needle is a safeguard against making an injection into a vein. If the dry needle should be in a vein, on detaching the syringe, blood would well up through it; if the needle remains free from blood, as is nearly always the case, there is reasonable security against introduction into a vein.

In general, in order to prevent leakage of the emulsion, it is desirable to introduce the needle on a slight slant in the tissue. This may be accomplished by drawing downward on the skin of the buttock, which permits a valve action as soon as the needle is withdrawn and the hand released. The injection if made slowly is practically painless. The development of

infiltrates and nodules of any considerable size, or in any number, during a course of injections, is either a reflection on the operator's technic or shows the case to be unadapted to this form of treatment. When an insoluble salt has been used, each of these nodules represents encapsulated mercury, and materially increases the danger of cumulative action. Daily massage by the patient will usually reduce them in a short time. If their formation cannot be prevented the patient should be given injections of a soluble salt.

CARE OF PATIENT WHILE TAKING MERCURY

Mercury as well as arsphenamine throws a burden on the kidneys; and patients under intensive treatment with mercury and arsphenamine should have the renal functions carefully watched. An examination of the urine for albumin and casts should be made weekly, and the development of definite nephritis during a course of treatment is an indication to stop. Treatment may be undertaken again after the nephritis has disappeared, but must be less vigorous than before and must be carefully watched.

Care of the mouth is a part of the general care which a syphilitic should have. Dental troubles should be looked after and the patient instructed in

the care of the teeth. When a syphilitic patient is sent to the dentist, the dentist should without fail be notified that the patient has syphilis in order that he may safeguard himself against infection. A dentifrice should be used, and it is a good plan to have the patients as a routine use an oxidizing mouth wash such as a one-half saturated potassium chlorate solution, or a diluted solution of hydrogen peroxid. When the gums are soft or unhealthy, a good astringent application is tincture of myrrh to be painted on two or three times daily, after brushing the teeth.

SALIVATION

If salivation occurs, the mouth should be cleaned at short intervals by washing with hydrogen peroxid solution or half saturated potassium chlorate solution. Compound solution of sodium borate (Dobell's solution) may also be used, and, while less effective, it has the advantage of being soothing. Pledgets of cotton or gauze moistened with boric acid solutions placed between cheeks and teeth give comfort and get rid of exudate. Atropin is useful, given to the point of reducing salivary secretion. If the patient has been using inunctions, he should, in order to get rid of mercury in the skin, be greased with an oil and then well washed with soap and water and put in

fresh clothes. He should have a soft, nutritious diet, be protected from exertions, and given the care for exhausting illness. In particular, he should be given an abundance of water.

ESTIMATING THE COURSE OF CASES

During the early course of syphilis, a Wassermann test should be made at monthly intervals, and after it has apparently become permanently negative, it should still be repeated at intervals of two or three months for at least a year. It should be remembered that the Wassermann test is not likely to be positive for the first ten days of the chancre. After it becomes positive, the obtaining of a single subsequent negative reaction means little; it must remain negative over a period of months to justify the conclusion that it is permanently negative.

In estimating the effect of treatment on syphilis, not only the disappearance of specific clinical symptoms and of the positive Wassermann reaction should be considered, but the patient's general well-being as well. In zeal to sterilize a patient of spirochetes the effect of the treatment itself on the patient should not be overlooked, and treatment should not be pushed beyond the point at which the patient is able to tol-

erate it without distinct lowering of his general physical tone.

A patient may be regarded as free from the necessity for further observations or treatment who, under observation and with Wassermann tests at intervals of two months, has remained free from all evidence of syphilis for a year.

There is room for difference of opinion as to the advisability of spinal puncture or a provocative injection of salvarsan with a subsequent Wassermann test in every case before discharge. Conservative practice reserves the use of these diagnostic measures to cases in which there are special indications.

LATE SYPHILIS

Late syphilis attacks most frequently the skin, the bones, the nervous system and the vascular system. The lesions in the skin and those in the bones usually present clinical pictures which are characteristic and should be recognized. Tabes and paresis are manifestations of syphilis. In all nervous diseases—and particularly cerebral diseases—whose symptoms suggest the gradual occlusion of a blood vessel or the presence of a tumor, syphilis should be at once carefully considered. Aortic aneurysm in probably all cases and most cases of aortic insufficiency are syphi-

litic. Syphilis not infrequently attacks the liver and occasionally the other abdominal viscera. It very frequently attacks the placenta and produces abortion. Indeed no tissue and no organ, with the possible exception of the prostate, is immune to syphilis; and its presence must, therefore, always be regarded as a possibility in obscure clinical situations. The failure to search for it, including the taking of a Wassermann test, as a routine procedure in cases where its presence is a possible factor, leads inevitably to important lapses in diagnosis.

On the other hand there is a tendency to magnify syphilis into an all-prevailing cause of disease which is not justified. Even with a positive Wassermann in a given case, the preponderating pathological condition has to be determined by the use of clinical judgment. For example, many cases of carcinoma of the mouth occur in patients who have syphilis and a positive Wassermann, but the carcinoma is not syphilis and will kill the patient, if the time for operation is lost in treating him for syphilis. It is rarely true, however, that treatment for syphilis will do a patient harm, if other necessary measures are not neglected; so that it is a safe rule to treat obscure cases for syphilis if there is a positive Wassermann or other reason to suspect syphilis.

The treatment of late syphilis is with mercury and arsphenamine, after the manner outlined already for early syphilis. The iodids of potassium and sodium are also of the greatest use for the late lesions and are not to be neglected in reliance upon arsphenamine. Either of these iodids should be given well diluted in water—the daily dose in from 3 pints to 3 quarts of water—and they should be taken after meals. When so administered they rarely cause annoying symptoms. Most late lesions of syphilis are readily influenced by moderate doses, ½ to 2 grams (8 to 30 grains), of iodid t. i. d. But the amount of sodium or potassium iodid that can be taken is large; and in nervous syphilis and in urgent cases the iodid should be given in large doses—4 to 8 grams (60 to 120 grains) or even more, t. i. d.

One of the open questions in syphilis now is how persistently treatment with arsphenamine should be pushed in the effort to render permanently negative a positive Wassermann, in patients whose infections are old—say three years or more—who are apparently healthy, or who have been relieved by treatment of other evidences of syphilis but in whom a positive Wassermann persists. In general it may be said that a reasonable effort should be made to render the

patient's Wassermann negative by repeated courses of arsphenamine and mercury. But that this effort should not be pushed without regard to contraindications, such as have been pointed out in the consideration of arsphenamine, or in the face of deterioration of the patient's health under the treatment.

SUMMARY

1. For the cure of syphilis it is of the greatest importance that the initial lesion of syphilis be recognized at the earliest possible moment.

2. To this end:

(*a*) Any excoriation, papule, nodule, crack, "hair cut," herpetic or other erosion—no matter how small—as well as any ulcer about the genitals or elsewhere—if there is any reason to suspect it—should be immediately and *before treatment* be *examined* for the *Spirochaeta pallida.*

(*b*) No lesion, whether a chancre or only suspected to be one, should be treated with mercurial or other antiseptics or be cauterized either with chemicals or with heat, before diagnostic examination for the spirochete has been made.

3. Chancroids should be suspected of harboring syphilis until repeated examinations for the *Spirochaeta pallida* and repeated Wassermanns have proved negative, and until sufficient time has elapsed for the appearance of secondaries.

4. No case should be treated for early syphilis until a positive diagnosis has been made either by the demonstration of *Spirochaeta pallida* or of a positive Wassermann reaction.

CLASSIFICATION

1. Primary Stage: Primary lesion present; *Spirochaeta pallida* present; Wassermann reaction often negative; adenopathy often absent.

2. Early Stage: First twelve months after primary stage.

3. Late Stage: Second twelve months and later.

DRUGS

Forms and Methods of Administration.—1. Arsphenamine.

(*a*) Intravenous only.

(*b*) Gravity method and slowly only.

2. Mercury.

(*a*) Forms.

1. Soluble.
   - Bichlorid.
   - Succinimid.
   - Benzoate.
2. Insoluble.
   - Salicylate in oil.
   - Calomel in oil.
   - Gray oil.

(*b*) Injection methods.

1. Soluble: Into the subcutaneous fat or into the gluteal muscles.
2. Insoluble: Into the gluteal muscles.

3. Iodids.

(*a*) Potassium.
Sodium.

(*b*) Solution by mouth.

DOSAGE

1. Arsphenamine.

(*a*) Normal dosage to be on the basis of 1 decigram to approximately each 30 pounds of body weight. First dose to be one half of the normal dose, that is, first dose to be 2 to 3 decigrams; subsequent doses 4 to 6 decigrams.

(*b*) Dilution to be not less than 25 c.c. of water for each decigram of arsphenamine.

2. Mercury.

(*a*) Soluble:

1. Normal dose of bichlorid succinimid or benzoate, 0.016 gm. (¼ grain) every second day.
2. Solution for administration to contain 1 or 2 per cent. of bichlorid or succinimid and 1 per cent. sodium chlorid, or 2 per cent. benzoate and 2.5 per cent. sodium chlorid, dose 12 minims of 2 per cent. or 25 minims of 1 per cent. solution, 0.016 gm. (¼ grain).

(*b*) Insoluble:

1. Normal dose of salicylate, calomel or gray oil, 0.064 gm. (1 grain) weekly.
2. Dilution:

   Salicylate, calomel and metallic mercury to be in a suspension of 10 to 20 per cent. in oil, five drops of 20 per cent. suspension or 10 drops of 10 per cent. suspension is the normal dose of 0.064 gm. (1 grain).

(*c*) The dose of any of the salts may be increased with caution.

3. Iodids:
   1. Standard solution contains 1 gm. (15 grains) of sodium or potassium iodid to each 1 c.c. of water.
   2. Dose to consist of 10 to 100 drops of solution, that is, ½ to 6 gm. (7.5 to 90 grains).
   3. Administer in large glass of water, three times a day.
   4. Only in nervous lesions are large doses of iodids required. From 1 to 3 gm. (15 to 45 grains) three times a day are sufficient for most other lesions of syphilis.

PATIENT

1. Examine for lesions of heart, blood vessels, kidneys and other viscera. If any are present, administer arsphenamine with extreme caution, and mercury carefully.

2. If the teeth are found so defective as to require attention, send case to dentist *with the diagnosis.*

3. Administration of:
   1. Arsphenamine:
      (*a*) Examine urine for albumin before each administration.
      (*b*) Give on an empty stomach.
      (*c*) If given in the morning, no breakfast, no dinner.
      (*d*) If given in afternoon, no dinner, no supper.
      (*e*) Rest, preferably in bed, until morning after administration.
   2. Mercury:
      (*a*) Examine urine for albumin and casts weekly.
      (*b*) Watch for sore mouth.
      (*c*) Watch for salivation.

COURSES

1. Arsphenamine and mercury to be given together when indicated.

2. Arsphenamine:

(*a*) Each course to consist of six doses.
(*b*) Doses to be administered at intervals of five to seven days.

3. Mercury:

(*a*) Each course to consist of:
1. Soluble forms, twenty-four to thirty injections.
2. Insoluble forms, nine to ten injections
(*b*) Doses may be cautiously increased.
(*c*) Doses to be administered over a period of eight to ten weeks.

4. Iodids:

(*a*) Give in latent syphilis.
(*b*) Give when tertiary lesions are manifest.

WASSERMANN TESTS, PERIODS OF REST AND COURSES OF TREATMENT

Primary and Early Stages.—First Twelve Months.—1. After the first course of arsphenamine and mercury, give the patient one month's rest.

2. At the end of one month, take Wassermann; if Wassermann is positive, repeat the complete course; if Wassermann is negative, repeat only the course of mercury.

3. At the end of the second course, rest two months; then give third course in accordance with the Wassermann conditions as outlined in first course.

4. Three courses with intervals of rest carry the patient through the first year of treatment.

Late Stage.—Second Twelve Months and Later.—1. During the second year, if Wassermann remains positive, repeat complete courses of treatment with intervals of rest of two months.

2. During the second year, if Wassermann is negative, give two courses of mercury with intervals of four months.

SCHEMA

FIRST YEAR

First course of treatment	2 to 2½ months
Rest	1 month
Second course of treatment	2 to 2½ months
Rest	2 months
Third course of treatment	2 to 2½ months

SECOND YEAR

(If Wassermann is negative)

Rest after third course	4 months
Course of mercury	2 months
Rest	4 months
Course of mercury	2 months

SECOND YEAR

(If Wassermann is positive)

If Wassermann remains positive, complete courses of treatment should be given with intervals of rest of two months each.

TREATMENT OF LATE SYPHILITIC LESIONS

These are to be treated by one or more courses of mercury or mercury and arsphenamine given in the same way as indicated for early syphilis. The use of mercury and arsphenamine in lesions should be combined with that of the iodids.

CHANCROID

Chancroid, more than gonorrhea or syphilis, is a disease of the careless and dirty. It is relatively uncommon among clean people. It is readily prevented by prompt prophylactic treatment: simple washing with soap and water after coitus greatly reduces the risk of infection with it.

Diagnosis.—Always in the presence of chancroid, a careful search should be made to determine whether or not there is also an infection with syphilis. In a very considerable proportion of cases, there is. One cannot rest safe with a diagnosis of chancroid, even when repeated examinations fail to discover the *Spirochaeta pallida.* The incubation period of the chancre is from two to three weeks longer than that of the chancroid, and it may emerge only in the healing chancroid, and then escape detection. Every chancroid must be regarded, therefore, as a potential case of syphilis; in addition to repeated examinations for spirochetes, Wassermann tests should be made at weekly intervals for six weeks, and the patient kept under observation for syphilis for two months.

General Treatment.—In order to hasten recovery, the patient with chancroid should be put to bed, kept

clean, and given a nourishing diet. Rest not only makes for a prompt healing of the chancroid, but greatly reduces the danger of bubo. Destructive chancroids are seen in the dirty and debilitated. If patients with chancroids are kept clean and well nourished, healing is usually prompt, and extensive ulceration very rarely seen.

Local Treatments.—Abortive Treatment: In a certain proportion of cases of chancroid, abortive treatment is successful. The principle of all methods of abortive treatment is to convert the infected ulcer into a sterile one by the use of some destructive agent. This may be either the actual cautery, or one of several strong chemical caustics.

The thermocautery is perhaps the best agent for this treatment. The ulcer is thoroughly cleaned and well dried. Then the entire area of it is seared with a cherry red cautery. Every particle of diseased tissue must be destroyed. It should be done under a general anesthetic, preferably gas.

Chemical cauterization is done as follows: The ulcer is well cleaned, being first irrigated and then dried. Then a pledget of cotton wet with 5 to 10 per cent. solution of cocain hydrochlorate or procain is applied to it. After anesthesia is produced the ulcer

is dried as thoroughly as possible, preferably with blotting paper, in order to prevent the running of the chemicals subsequently to be applied. After it has been thoroughly dried, the entire surface of the ulcer, both edges and base, is touched with pure liquid phenol (carbolic acid) applied on a small cotton swab, care being taken to let no infected point escape. Then the excess of phenol on the surface is taken up, and nitric acid is applied lightly in the same way. The ulcer should be flushed immediately with sterile water to stop the action of the acid. Instead of nitric acid a saturated solution of zinc chlorid can be used. This is as active a caustic as nitric acid, and its action should be stopped as quickly after application by flushing with water.

After cauterization in any of these ways, the wound should be dressed with cold compresses of boric acid solution or similar bland solution. There results an acute inflammatory reaction, the slough is thrown off, and in successful cases, a healthy granulating surface is left.

The advantage of these methods of treatment is that, in successful cases, healing takes place quickly and the danger of bubo is almost eliminated. Their success depends on thoroughness in destroying the infected area. If the procedure fails to do this com-

pletely, it does harm, because it produces a larger ulcer which becomes infected from the focus of disease that has been left. Attempts at abortive treatment with superficial caustics, such as silver nitrate, are always failures. Attempts at abortive treatment should not be made unless the prospects of complete destruction of the diseased tissue are good.

Abortive treatment is contraindicated under the following conditions:

1. When the diseased area or areas are so extensive or so situated that the destruction produced by this treatment would result in considerable deformity. The chief situation in which it is contraindicated is in chancroid at the meatus.

2. When the inflammatory reaction is already intense and there is much edema. These would be increased by cauterization.

3. When there is inguinal adenitis. This would be aggravated by cauterization.

4. In healing chancroids. Here the infection is already under control and nothing would be gained by cauterization.

Abortive treatment will, of course, interfere with any further search for spirochetes. For this reason it should never be undertaken until every reasonable effort to find the spirochetes has been made. The

early diagnosis of syphilis is so much more important than the prompt healing of a chancroid, that efforts to heal the chancroid should be given no consideration until the question of diagnosis is settled as far as possible. And after successful abortive treatment, there should be no relaxation in the weekly Wassermann tests or in the clinical observations until syphilis can be finally ruled out.

In all cases, except those favorable for abortive treatment, reliance is placed on cleanliness, the use of antiseptics, and measures to promote healing. The first principle in treating chancroids is to keep them as free as possible from pus, both to promote healing of the ulcer and to prevent infection of the lymphatics. In all cases, for the effect of the heat as much as for cleaning effect, the patient should hold the penis in hot water for half an hour several times daily. Then the lesion should be given a copious warm irrigation with boric acid solution or mercuric chlorid, 1 : 10,000, or potassium permanganate, 1 : 3,000, or some other nonirritating antiseptic solution. Then the ulcer should be dusted with an antiseptic, such as iodoform (the preferable antiseptic), thymol iodid, calomel or argyrol. After this there should be applied a moist dressing of one of the solutions which are used for irrigating the ulcer. In very acute cases, a good dress-

ing is one wet with aluminum acetate solution, one part of the 8 per cent. solution of aluminum acetate to seven or fifteen of water. The dressings must be kept continually moist and changed frequently enough to prevent accumulation of pus on the ulcer.

When for any reason it is impracticable to keep a wet dressing constantly applied, the next best course to pursue is to dust the ulcer after irrigation with argyrol crystals or iodoform and then cover it with gauze, spread with petrolatum. Dry powders alone are not good applications for chancroids. They cake into crusts, under which the pus accumulates, and this materially increases the risks of infection of the lymphatics and the occurrence of bubo.

Occasionally in the course of healing of chancroids, the granulations become sluggish; in such cases, stimulation by the application of balsam of Peru works well, or the granulations may be touched occasionally with silver nitrate. If there is an overgrowth of the unhealthy granulations, they should be trimmed off with a knife or razor or seared with a cautery, and then dressed with iodoform and a wet compress.

In chancroids under a greatly swollen or long, tight prepuce, wet dressings cannot be used. In these cases prolonged soakings in hot water several times daily are particularly serviceable. After each soaking the pre-

putial sac should be cleaned by inserting into it a catheter or a long flat syringe nozzle and thoroughly irrigating with hot antiseptic solution. After the irrigation there should be injected into the preputial sac from 2 to 4 c.c. of a suspension of antiseptic powder in oil or glycerin, such as 20 per cent. calomel, 10 per cent. thymol iodid or 10 per cent. iodoform in oil or glycerin. Of these, 10 per cent. iodoform in glycerin is best.

In patients with a long prepuce it is best not to make a dorsal slit, if progress can be made without so doing; for if a dorsal slit is made, the whole surface at once becomes chancroidal. Not infrequently in cases with intense reaction and great swelling no headway can be made while the prepuce is intact; in other cases the reaction becomes so exaggerated that, unless relief of tension is given, sloughing of the prepuce will occur. Under these conditions a linear slit along the dorsum of the prepuce should be made, and the case then treated as an open chancroid. A complete circumcision should never be attempted until the infection has entirely disappeared.

BUBO

Under the usual conditions of treatment of chancroids, when patients are not in bed, suppurative in-

guinal adenitis occurs in from 30 to 50 per cent. of the cases. But the factors that predispose to bubo are muscular activity and accumulation of pus on the chancroid; so that with patients in bed and with their chancroids kept free from pus, bubo is a relatively infrequent complication.

When bubo threatens, extra care should be used to see that there is no absorption of pus from the chancroid; the patient should have complete rest; and hot applications should be applied. If fluctuation develops, the hot applications are continued until the gland has fully broken down. When it is soft throughout and full of pus, a small incision with a double edge knife should be made, and the pus evacuated. Iodoform glycerin, 10 per cent., is then injected into the cavity. The emulsion should be injected three times at the first sitting. The first two injections run out and the last one remains in. The wound is then bandaged with gauze, moistened with solution of aluminum acetate, one part in seven of water, or boric acid solution, or some other antiseptic solution. On the following day, the wound is emptied by squeezing, and iodoform emulsion injected once and left in. The bandage is then applied, and in five or six days the wound is closed and healed. If after a week the wound is not

closed, it should be injected again; this will usually result in healing in five or six days.

The method of injecting the wound with silver nitrate solution has been abandoned on account of the pain that it causes and because it is no better than the injection with iodoform.

The plan of encouraging suppuration and evacuating the pus through a small incision is satisfactory in most cases when the glands break down rapidly. But sometimes suppuration goes on very slowly; and in these cases, it is better to make a free incision, evacuate the pus, and dissect or curet out the partially broken-down remains of the glands. Then the wound is packed with gauze and allowed to heal by granulation. It is better to avoid this course if possible, as the subsequent healing takes six or eight weeks, and requires daily dressing.

It was the practice a few years ago to endeavor to prevent suppuration in the glands by dissecting them out and trying to get a clean wound which was closed by suture. This practice has now been abandoned because it was found that a solid edema, or elephantiasis, of the penis and scrotum and inguinal region often followed, in consequence of the obliteration of the lymphatic vessels in the area of the wound. Another objection was that, when patients came to

operation, suppuration had nearly always begun in the center of the gland, even though no fluctuation was evident; the wound was not aseptic and could not be closed, but had to be left open for the slow process of healing by granulation.

BALANITIS GANGRENOSA

EROSIVE OR GANGRENOUS BALANITIS

In connection with chancroid attention is called to this venereal infection, which while rare is important, because of its destructive course, if unrecognized and treated as chancroid.

Balanitis gangrenosa is an affection which begins as small whitish excoriations, situated in the coronary sulcus or on the adjacent part of the glans or prepuce. They always occur under a long prepuce. These excoriations develop into superficial small round ulcers, which coalesce into larger polycylic ulcers. The ulcers are covered by a closely adherent necrotic membrane and bleed easily on its removal. They discharge an abundant offensive thin yellowish or brownish pus. The lesions may heal without extending beyond the stage of excoriation, but more frequently they form gangrenous ulcers. When this occurs destruction is very rapid. If the ulcer is situated on the inner surface of the prepuce, it may be visible as a dark area through the prepuce and is likely to cause quick sloughing of it. Situated on the glans it rapidly destroys it. It may spread quickly to the shaft and

cause partial destruction of the penis or even its complete amputation down to the pubis.

Lymphangitis and inguinal adenitis occur both with the erosive and gangrenous forms, but the glands do not suppurate as they do in chancroid.

Both in erosive and gangrenous balanitis, the parts are extremely sensitive, but urination is not painful except when phimosis causes distention of the preputial sac with urine. Systemic symptoms are usually absent or trivial. Even in the gangrenous cases, sepsis is slight. Occasionally the symptoms are more marked, and there may be a temperature of 103 or 104 F.

ETIOLOGY

The disease is produced by a symbiosis of a spirillum and a vibrio identical with those producing Vincent's angina and noma. It may be the same infection that produces hospital gangrene. Tunnicliff, from her studies of Vincent's angina, believes that the spirillum and vibrio are the same organisms, occurring in different forms under different conditions. The vibriones are curved rods with pointed ends, about 2 microns long and 0.8 of a micron in width. They stain with ordinary dyes and are gram-positive, but require careful decolorization with 70 per cent. alcohol. The spirilla occur as loose wavy spirals and are 6 to 39

microns long and 0.2 of a micron broad. They move rapidly with a quick back and forward snake-like movement. They stain with the ordinary dyes and are gram-negative. The vibriones may be cultivated on serum agar. They are anaerobic and are found in the deeper part of the necrotic tissues. The spirilla which are less abundant are found in the superficial lesions. The spirilla occur as saprophytes in the mouth, and the infection probably originates most frequently from the saliva. The spirilla are not pathogenic, except in association with the vibriones and under anaerobic conditions or in patients with greatly lowered resistance.

DIAGNOSIS

The presence of erosive or gangrenous lesions near the corona under a long prepuce, the peculiar bad smelling yellowish or brownish purulent discharge, and, in the gangrenous cases, the rapid destruction are characteristic clinical features distinguishing the condition from chancroid. In addition, the vibriones and spirilla are demonstrable in the discharge and in the tissues. The inflammatory reaction, the edema of the prepuce, and the degree of phimosis are greater than in chancroid. There is moderate enlargement of the inguinal glands, but they are painless and do not suppurate, as they usually do with a long prepuce in

chancroid. As with chancroid, the lesions may mask syphilitic infection, and the cases require watching subsequently for syphilis, in the same manner as do cases of chancroid. Prompt recognition of the infection is important, because of the destruction which may quickly result if its character is not recognized and prompt treatment instituted.

TREATMENT

The key to treatment lies in the fact that the organisms are pathogenic only under anaerobic conditions. The lesions must be exposed so that oxygen can reach them, or their spread cannot be controlled. The glans must be completely uncovered by a dorsal slit of the prepuce. After this, the affected parts should be left without occlusive dressings and frequently washed with hydrogen peroxid solution. The best measure is continuous irrigation with dilute hydrogen peroxid solution. With exposure of the lesions to the air and the use of hydrogen peroxid, healing is usually rapid.

THE TREATMENT OF GONORRHEA

GENERAL CONSIDERATIONS

The earlier cases of acute gonorrhea are seen, the better are the chances for rapid cure and the less the dangers of posterior urethritis and the complications of gonorrhea. With gonorrhea, as with syphilis, persons should be encouraged to report on the slightest suspicion of trouble, and those who have been exposed should be watched for a week for manifestation of the disease. On its appearance, treatment should be instituted immediately. Every patient with acute urethritis should be placed at rest at once.

The patient should be given instructions, preferably printed,[2] on the part he must take in the conduct of his case. In all cases he must be warned of the danger of carrying the disease to his eyes, and of gonorrheal ophthalmia; and of the necessity of washing his hands after touching his penis or anything contaminated with his pus.

At the first examination of every case of gonorrhea, the patient should be stripped in order to permit a gen-

2. See page 157 for an example of such instructions.

eral survey of his condition. Note should be made of the amount of discharge and of the condition of the glans and prepuce. Smears of the urethral discharge should be made on a cover glass for microscopic examination. The presence or absence of chancre and chancroid should be determined, and the testicles should be examined for a beginning epididymitis. Then the patient should be instructed to pass his urine into two glasses.

Two-Glass Test.—The two-glass test should be made at each examination for the purpose of watching the progress of the case by determining: (*a*) if the posterior urethra has become affected; (*b*) the amount of pus secreted.

The urine passed during gonorrhea appears turbid from admixture with pus, in which are little clumps or masses of desquamated epithelium. After standing, the pus settles to the bottom of the glass and a cloud of mucus appears floating above it. As the patient goes on toward recovery, the pus disappears, but the hypersecretion of mucus continues and occasions a cloudiness of the urine, giving it a mucilaginous appearance. After the mucus disappears, the "clap-shreds" persist for months, because isolated portions of mucous membrane are not covered with epithelium and are still secreting pus.

In the two-glass test, if the anterior urethra alone is affected, the first glass of urine will be cloudy and the second glass clear; but if the posterior urethra is involved both glasses will be turbid from the presence of pus. These findings are accounted for by the action of the cut-off muscle which forms a barrier between the anterior and posterior urethra. It prevents pus in the anterior urethra from flowing back into the bladder; so that in anterior urethritis alone, the pus in front of the cut-off muscle is washed out in the first flow of urine, while the last of the urine will flow over a clean surface and remain clear; that is, the first glass will be turbid, the second clear. On the other hand, in posterior urethritis, the cut-off muscle holds back the pus, as it does the urine in the bladder, and the pus flows back into the bladder and renders all the urine turbid. When the urine in posterior urethritis is passed into two glasses, the second glass is turbid as well as the first. If it is desired to determine the condition of the anterior urethra in posterior urethritis, it can readily be done by irrigating the anterior urethra with saline solution and collecting the washings in a glass for inspection.

Microscopic Examination of Pus.—Microscopic examinations of pus are indispensable, not merely for

the establishment of a diagnosis of urethritis caused by the gonococcus from that caused by some other organism, such as the colon bacillus, a staphylococcus or a streptococcus, but also for the observation of the progress and stage of the disease, for the selection of the appropriate treatment for the different stages, and finally for the purpose of determining whether the gonococci have been eliminated and the patient cured.

THE GONOCOCCUS

The gonococcus is coffee-bean or kidney shape, and is usually found in diplococcus form, the flat or slightly indented side of the organisms facing each other. In pus from acute gonorrhea organisms are found both within and without the cells, crowded in masses in the leukocytes. The intracellular location of the organisms is of diagnostic importance, but it is not so characteristically seen in pus from chronic cases.

The gonococcus is easily stained with methylene-blue or with most of the other anilin dyes. It is a gram-negative organism, and for the purpose of differentiation from other diplococci a Gram stain is necessary. It is quickly decolorized by Gram's method and can then be counterstained with safranin or fuchsin or other stain. The Gram stain does not furnish an

absolutely characteristic differentiation of the gonococcus from all similar cocci, but in pus from the urethra or vagina, or from the eye in cases of acute conjunctivitis, it may be accepted as a reliable test.

For the absolute differentiation of the gonococcus cultural methods are necessary.

In the prodromal stage when the discharge from the meatus is thin and scanty, microscopic examination of smears shows quantities of desquamated cylindric epithelial cells and a moderate number of pus cells containing clumps of intracellular gonococci. In the ascending stage a large number of pus cells, many of them containing gonococci, and a number of free gonococci are to be seen. The stage of decline is indicated by the appearance of squamous epithelial cells, showing that the erosions have begun to cicatrize and have become covered with newly formed epithelium. Clumps of gonococci are also present, adhering to the epithelium. The pus cells have diminished in numbers and a smaller number of them contain gonococci. As the disease continues to improve, pus cells and gonococci disappear, and finally the discharge from the meatus is found to be composed only of squamous epithelium, mucus, and an occasional pus cell, without gonococci

PROGNOSIS

The virulence of the gonococcus differs in different cases. It is often noted that when a person has chronic gonorrhea for months or years, the gonococci, when transplanted into the tissues of another person, are not capable of producing such virulent inflammatory symptoms as when taken from a fresh case. This attenuated virulence explains the fact that in such cases the period of incubation is comparatively long and the purulent discharge scanty, while the cases often become chronic and result in prostatitis and stricture.

Another factor which influences the prognosis in gonorrhea is the state of the patient's general health. Gonorrhea acquired by persons affected with phthisis, or who are debilitated from any cause, is apt to run a subacute, but exceedingly protracted course. The other causes which retard recovery may be grouped as follows: (*a*) complications, posterior urethritis, prostatitis, etc.; (*b*) reinfection from a urethral gland, seminal vesicle, prostate, etc.; (*c*) lack of rest; (*d*) alcoholic indulgence; (*e*) too vigorous treatment, especially injections which are too strong or too frequently repeated; (*f*) coitus.

ACUTE GONORRHEA

In order to aid the natural process of repair, the first essential is rest. No other measure contributes so much to a prompt and uncomplicated recovery as rest in bed during the acute stage of gonorrhea. The patient should, if possible, be put to bed and kept there during the ascending stage of from one to two weeks, or until the discharge becomes mucopurulent and the burning on urination has disappeared.

In order to keep the urine bland and unirritating and to promote frequent urination, so as to clear the urethra from the products of inflammation and to expel free organisms that may reinoculate new areas, the patient in bed should drink one glass of water every hour. The diet should be bland and of a low nitrogen content; highly seasoned and rich foods should be strictly excluded; cereals, fruit juices, toast and cream with a moderate amount of milk should make the bulk of the meals.

Alkalis and alkaline mineral waters should not be prescribed, because of their effect on the reaction of the urine. An acid reaction of the urine is the best safeguard against a cystitis from bacteria that find their way into the bladder. The acidity of the urine will be reduced sufficiently by the free use of milk

and the abstinence from meat. The bowels should be kept open with aperients, and during the very acute stage a saline cathartic should be administered every other morning.

Dressings for the purpose of catching the urethral discharge to keep it from soiling the clothing always should be worn. Several varieties may be used: (*a*) for patients with a long foreskin, the familiar gauze butterfly; (*b*) for patients unable to hold the butterfly, a 4-inch gauze-bandage-bag with a little gauze in the bottom, made fresh daily or oftener, or (*c*) a loose bag, made by cutting off the foot of a stocking, into the bottom of which gauze can be placed to catch the pus. The bags are to be suspended from a waist band. The loose bags permit and encourage a free flow of pus from the urethra, while they prevent retention. Constriction of the penis by dressings wrapped around it should carefully be avoided so as to insure no interference with the return circulation. A suspensory bandage should be worn when the patient is allowed to get up, in order to relieve the sensation of dragging on the spermatic cord and to lessen perhaps the danger of epididymitis.

Oil of sandalwood is soothing and curative to the mucous membrane; it may be given during the acute

stages, but will have little effect owing to dilution from the drinking of large quantities of water. Sandalwood oil should be administered in capsules in doses of from 0.5 to 1 c.c. (8 to 15 minims) three times a day after food. It sometimes disagrees with the digestion, or it may cause an intense pain in the back; when such symptoms occur, it should be discontinued. No copaiba nor cubebs should be given in acute gonorrhea; they are serviceable only in the declining stages.

SEVERE ACUTE URETHRITIS

In very severe urethritis with intense reaction, profuse discharge, and great swelling and edema, it is good judgment to wait for some subsidence of the symptoms before beginning injections. In the meantime the parts should be kept clean; the penis held in hot water for fifteen minutes at a time every few hours, and hot sitz baths given every three or four hours to relieve distress. If sitz baths are unobtainable, hot fomentations may be substituted. If pain on urination is very distressing, it may be relieved by an injection, five minutes before urination, of 1 c.c. of 1 per cent. solution of cocain hydrochlorate or procain. Sandalwood oil diminishes the pain on urination in

most cases, so that the use of a local anesthetic is not often necessary.

Local Treatment.—In the ascending stage of acute urethritis and in other acute cases, which do not reach the intensity suggested in the preceding paragraphs, local treatment by injection may begin at once.

In selecting the drug used for injection, it is necessary to bear in mind the indications for its use, which may be thus formulated:

1. To destroy the gonococci in all foci within reach as early and completely as possible.

2. In doing so, to avoid irritation of the mucous membranes, any exacerbation of the existing inflammation and everything that has a caustic action on the tissues, and all unnecessary pain.

These indications are very well met by the silver protein compounds of the argyrol and protargol type. The syringe should be all glass, of 5 c.c. capacity, with a smooth acorn tip. For injection, *fresh* solutions in water of the following strengths are used: argyrol, from 3 to 5 per cent.; protargol, from 0.25 to 1 per cent. Before injecting, the urine should be passed so as to wash out the pus accumulated in the urethral canal. In making injections the tip of the syringe should be firmly pressed into the

meatus, and the penis should be held under moderate tension. The solution should be injected with the utmost gentleness. It should be held in the urethra for at least five minutes. If injections produce distress, their strength should be reduced. Injections should not be given frequently enough nor sufficiently concentrated to cause any irritation of the mucous membrane; an injection which is too often repeated or is too concentrated prolongs the course of the case. In practice it is found that once in two hours is sufficiently often to destroy the gonococci without damaging the inflamed mucous membrane, provided the injection is carefully given and the solution is not too strong.

SUBACUTE ANTERIOR URETHRITIS

After from ten days to three weeks in those cases that run a favorable course under the treatment with silver proteinates, the acute symptoms disappear. The discharge becomes watery and scant; microscopic examination reveals many newly formed desquamated epithelial cells and few or no gonococci; the urine in the first glass becomes clear or slightly turbid, although it contains many long mucous filaments. If treatment is now discontinued, relapse with extensive reinfection is certain to occur in from two to three weeks

from the few gonococci left in the tissues. When the gonorrhea has reached this subacute stage, the task remains of curing the existing postgonorrheal lesions, which consist of a catarrhal inflammation of the mucous membrane, erosions, periglandular infiltrations, and infiltrations of the submucous tissues. Since the silver proteinates only destroy the gonococci and have little effect on the inflammatory processes, it is necessary at this time to treat the existing catarrh of the mucous membrane with astringent remedies. At this point in the progress of the disease it is highly desirable to substitute copious irrigations of the urethra for the hand injections.

Irrigations.—The solution best adapted for the double purpose of destroying the few remaining gonococci and of acting as an astringent to cure the superficial postgonorrheal lesions of the mucous membrane is silver nitrate in strengths of from 1 : 3,000 to 1 : 5,000 of distilled water. Irrigation with silver nitrate solution acts particularly well in the presence of a clear urine containing shreds of pus or mucous. It may be used every day or every other day. Potassium permanganate in water solution of the strengths of from 1 : 3,000 to 1 : 5,000 is also useful for irrigations. It is especially called for when there is a free purulent discharge containing no organisms and may be

repeated three or four times daily, if it does not produce irritation. A purulent discharge that arises from the presence of a nongonococcic bacterial urethritis yields to daily irrigation with mercuric oxycyanid in solution in water in strengths of from 1 : 3,000 to 1 : 5,000. This should never be used if the patient is taking iodid or iodin in any form. The irrigations should be given at temperatures of from 110 to 115 F.—as hot as can *comfortably* be borne.

Technic of Irrigations.—The patient should sit well forward on the chair, resting his shoulders against its back, or he may stand. He should hold a small basin to catch the overflow of the irrigation. The irrigator tip is pressed against the meatus and the anterior urethra distended with fluid. Then by a short release of pressure of the tip a return flow is allowed. This is repeated until thorough irrigation of the anterior urethra has been obtained. If it is desired to irrigate the posterior urethra, the anterior urethra should first be washed out. Then the tip should be firmly pressed against the meatus and the anterior urethra dilated with fluid. The patient is then instructed to take a long breath and to try to urinate; this releases the cut-off muscle and the irrigating fluid flows into the bladder. The bladder is allowed to fill

with fluid, but should not be distended beyond the point of comfort. After the bladder is filled, the patient empties it by urination. Should difficulty be experienced in irrigating the posterior urethra from the meatus, a soft rubber catheter may be introduced through the cut-off muscle into the posterior urethra and the bladder filled through the catheter. The patient then urinates after the catheter is removed.

Under the irrigation treatment the urethral discharge ceases, and the shreds disappear from the urine, but before the patient is declared cured the condition of the prostate and vesicles must be investigated and the urethra must be found to be free from stricture.

It should be borne in mind that it is possible to treat a gonorrhea too long, and to cause the discharge to persist by the simple irritation of injections. In such cases, there will be a secretion free from gonococci which on squeezing will appear at the meatus as a small, transparent, glycerin-like drop, and which will cause sticking together of the meatus in the morning. In cases manifesting this condition, it is advisable to stop treatment and to allow the irritation to subside. In consequence. the mucous discharge will often disappear spontaneously.

ACUTE POSTERIOR URETHRITIS

Posterior urethritis develops as a rule after acute anterior urethritis has become subacute, that is, from the second to fourth week of infection, or later. It occurs in about half of the cases of gonorrhea. Its occurrence is usually due to the spontaneous spread of the infection from the anterior urethra; but not infrequently the tendency to its spread is increased by too vigorous local treatment, particularly by injudicious instrumentation. It may occur as a very severe process, or more frequently as a subacute one. In addition to the urethra, it is likely to involve the prostate and the base of the bladder, and frequently it spreads to the seminal vesicles and the epididymis.

The onset of posterior urethritis will not escape detection, if the two-glass test is done daily as a routine measure. A turbidity of both glasses, when due to pus and not to phosphates, denotes involvement of the posterior urethra. With this will occur frequent, painful urination.

Severe posterior urethritis demands complete rest in bed and measures directed to the relief of the distressing symptoms. All local treatment of the urethra should be suspended. The nearer the diet approaches to a liquid or milk diet, the better. Abundant water

should be taken, but diuretics should not be used, because they cause the too frequent evacuation of an already overtaxed bladder. Saline cathartics should be given every other day to reduce congestion in the pelvis. For the relief of tenesmus and pain, hot sitz baths of half an hour's duration, repeated several times a day, are useful. Alkalies, which favor the growth of bacteria in the bladder by rendering the urine alkaline, are contraindicated, as they are in acute urethritis. Sandalwood oil is not only curative but soothing and gives relief in many cases. In the severe cases morphin should be given to relieve tenesmus and desire to urinate. It is best to give it in these cases in rectal suppositories.

As a rule, the acute stage of posterior urethritis disappears promptly, and the cases pass into the condition of mild posterior urethritis, and then should be treated as such.

Treatment of Mild Posterior Urethritis.—In subacute posterior urethritis, treatment is given on principles similar to those applicable to subacute anterior urethritis. Solutions are applied to the surface, either by the injection of small quantities of concentrated solutions or by irrigations of copious quantities of dilute solutions.

In the first method, a small soft rubber catheter is introduced just beyond the cut-off muscle, and by means of a small urethral syringe about ten drops of 1 : 500 to 1 : 100 solution of silver nitrate are introduced into the posterior urethra. This is to be repeated at intervals of one or two days according to the tolerance of the case. In order to prevent immediate precipitation of the silver by the urine, the injection should be made with the bladder empty.

Urethrovesical irrigations by the gravity method are particularly applicable to the treatment of posterior urethritis. They are given through a gravity irrigator elevated five to six feet above the penis, according to the technic already described for irrigation. For posterior irrigations, protargol or similar silver protein preparation in the strength of from 1 : 1,000 to 1 : 250, or silver nitrate from 1 : 10,000 to 1 : 4,000 are used. Less effective, but still useful in some cases, is potassium permanganate, 1 : 3,000.

As a rule, posterior urethritis extends to the prostate and seminal vesicles, and persistence depends on reinfection from these structures. In every case these structures should be examined and, if necessary, treated.

COMPLICATIONS OF ACUTE GONORRHEA

FOLLICULITIS

Folliculitis consists in suppuration of one of the urethral follicles with retention of the pus, forming a small abscess. This, if left to itself, opens spontaneously either into the urethra or through the skin. If it ruptures through the skin it is likely to leave a fistula in the urethra which is very persistent. The treatment consists in opening the abscess freely as soon as fluctuation is noticed, evacuating the pus, and allowing it to heal by granulation. It should be opened through a urethroscope from within the urethra, when this is practicable. If incision is done promptly, the occurrence of a persistent urethral fistula is prevented.

CHORDEE

The patient subject to chordee should empty his bladder just before going to bed; should sleep in a cool place, lightly covered; and, to avoid sleeping on his back, should tie a towel around his waist with a knot at the back. Before going to bed the penis should be given a prolonged immersion in hot water.

When the patient wakes with chordee, he should get out of bed and immerse penis and testicles in cold or hot water, and before going back to bed should empty the bladder. He should be warned of the danger of "breaking" a chordee. In severe cases sedatives are necessary; potassium bromid, 2.0 gm., or camphor monobromate 0.3 gm., in the afternoon and before going to bed, are useful; in extreme cases a morphin rectal suppository may be necessary.

EPIDIDYMITIS

Immediately on the development of epididymitis all injections or instrumentation of the urethra must be stopped, the patient be confined to bed, and put on a light diet. The testicles should be elevated by a bandage going under them and over the thighs, and hot applications should be made. Hot sitz baths for half an hour three times daily are soothing and hasten recovery. If the symptoms are severe, epididymotomy may be performed. This immediately relieves pain and hastens recovery.

In a few days the acute stage passes. The urethral discharge is then likely to recur, but local treatment of the urethra must be resumed only after a considerable period of rest and with the greatest caution. A suspensory bandage should be worn until the patient

is entirely well. There is in many of these cases a chronic inflammatory exudate in the epididymis, which in time often disappears. Massage of it may hasten its absorption.

ACUTE PROSTATITIS

In acute prostatitis the indications are (1) to lessen the severity of the posterior urethritis; (2) to prevent suppuration of the prostate; (3) if pus forms, to evacuate it promptly by incision.

The patient should be put to bed, sandalwood oil administered, and, if necessary, the pain and tenesmus controlled by opium suppositories. Locally either ice-bags or hot poultices are applied to the perineum, a safe guide for the choice between hot and cold applications being the amount of comfort which is given to the patient. Hot sitz-baths of from one-half hour to an hour's duration two or three times daily are always indicated. Irrigation of the rectum with hot water for half an hour at a time may be used instead. A rectal prostatic irrigator or in its absence a return-flow catheter is introduced into the rectum, and a continuous flow of water as hot as can be borne, is passed through it.

If retention of urine should occur, it may be necessary to introduce a catheter, but this should be done

only when absolutely necessary. Before catheterizing, the urethra should be well irrigated to free it from pus. One c.c. of 2 per cent. cocain solution may be injected into the urethra to relieve pain and facilitate catheterization.

Prostatic Abscess. — When a very limited area of suppuration of the prostate is present, involving perhaps two or three of the prostatic tubules, the temperature is only slightly elevated, and the local symptoms are not marked. After two or three days the temperature becomes normal and the tenesmus and frequent urination disappear. In such cases an incision into the prostate is not required, for the minute abscess generally ruptures into the urethra and the sinus fills in by granulation.

If, on the contrary, the symptoms do not improve within the first week, but the fever continues and chills occur, the local symptoms grow worse, and rectal examination shows an increase in the size of the inflamed prostate, it is evidence that an abscess is forming. These symptoms constitute an urgent indication to evacuate the pus; for if the pus is allowed to break through the capsule of the prostate, it will burrow through the tissues and may cause urinary infiltration and pyemia, or, at least, a fistula which will not

heal without operation. In these cases immediate surgical measures are indicated. Two operations may be used to evacuate the pus.

1. The prostate may be exposed by a transverse incision in the perineum, and the collection of pus evacuated without opening the urethra.

2. An incision may be made in the perineal urethra, the mucous membrane of the prostatic urethra broken through with the finger, and the pus collection evacuated through the opening thus made.

ACUTE SEMINAL VESICULITIS

The general treatment of acute vesiculitis is the same as that for acute prostatitis, with which it is usually associated. Injections into the anterior urethra, of course, are contraindicated; but above all things, any attempt at massaging or stripping the vesicles should be avoided.

GONORRHEAL OPHTHALMIA

EVERY CASE OF ACUTE CONJUNCTIVITIS IN A GONORRHEAL PATIENT IS A CONDITION REQUIRING EXPERT ATTENTION, AND SHOULD BE IMMEDIATELY REFERRED TO AN OPHTHALMOLOGIST.

CHRONIC GONORRHEA

Gonorrhea may be said to be chronic when it has lasted over six weeks. Chronic gonorrhea is always dependent on distinct pathologic changes in the tissues, the nature of which must be understood in order to apply correct treatment. For instance, it is useless to attempt to cure a urethral discharge from a chronically inflamed area behind a stricture, by massaging the prostate. It is equally futile to endeavor to relieve a urethritis depending on a chronic prostatitis, by dilatation and irrigation of the urethra. In most cases of chronic gonorrhea, especially those of long standing, the prostate, vesicles and urethral canal participate in the pathologic changes, and it is necessary to carry out the examination in a systematic manner in order not to overlook the various lesions. The following scheme for this examination is found to be practical:

1. History taken.
2. Inspection of external genitals.
3. Urethral smears taken for microscopic examination.
4. Urine passed: two-glass test.
5. Prostate and vesicles palpated by rectum, and expressed material collected on a glass slide for gross and microscopic examination.

6. Bougie à boule examination of urethra for stricture, and meatotomy if necessary. For this purpose a bougie with a 26 or 28 F. tip should be used.

7. Endoscopic examination of anterior urethra; also of posterior urethra in special cases.

All findings should be recorded as the examination is made.

CHRONIC ANTERIOR URETHRITIS

The important pathologic change in the urethral tissues in gonorrhea is an infiltration of small round cells underneath the mucous membrane, surrounding and embedding Morgagni's crypts and Littré's glands. If the infiltration is superficial it is absorbed, but if it is extensive, the round cells become converted into connective tissue, forming stricture. The mucous membrane lining the urethra is destroyed in spots, leaving erosions, and these erosions as a result of inflammatory proliferation become converted into areas of granulations. In other cases the mucous membrane is not eroded and no granular patches are present; instead of loss of substance there is swelling, congestion and edema of the mucous membrane, which is the seat of chronic inflammation. The infiltration around the crypts of Morgagni keep their mouths open, which condition permits the cavities to become incubating places for colonies of gonococci, from which reinfections repeatedly take place. The above described con-

ditions occasion a continuous gleety discharge, which will remain until they are removed.

Treatment.—Based on the pathologic changes in the tissues, the indications for treatment are:

(*a*) To rid the tissues of gonococci.

(*b*) To cure the catarrhal inflammation in the mucous membrane and promote the formation of squamous epithelium to cover the erosions.

(*c*) To cause absorption of the submucous infiltration.

(*d*) To restore to normal the intraglandular and periglandular inflamed and infiltrated tissues.

These indications can be met by irrigations with antiseptic and astringent solutions and by dilatations of the urethra with sounds and soft bougies.

When general catarrh of the mucous membrane is present and turbidity of Glass 1 exists, free irrigation of the urethra and bladder by the gravity method, daily or every second day, using silver nitrate or potassium permanganate, soon clears up the diffuse inflammation in the mucous membrane, until the process is no longer general, but is reduced to isolated spots. This condition is denoted by Glass 1 being no longer turbid; it does, however, still contain the shreds derived from isolated erosions which are not covered by

epithelial cells and are still secreting pus, or from the prostatic ducts and Morgagni's crypts. Comma-shaped shreds which are often present are formed by the secretion from the open mouths of the prostate ducts and Morgagni's crypts. Gonorrheal shreds floating in clear urine continue until the submucous infiltrations resolve and the pathologic secretion of the prostate and crypts disappears.

In order to promote the absorption of the submucous infiltration it is necessary to pass steel sounds large enough to distend the urethra fully and put the ring of infiltration on the stretch. Meatotomy may be necessary in order to pass sounds of sufficient size.

The therapeutic effects of the sound can be materially increased by massaging the urethra over it with the fingers. The contents of Morgagni's crypts can in this way be expressed, and more favorable influence is exerted on the ring of infiltration in the submucous tissues.

Sounds may be passed too frequently. In cases of soft and recent infiltration, the intervals should be from four to seven days, always waiting until the reaction following has subsided. In cases of hard, organized infiltration the intervals should be a week. If the urethra is acutely inflamed and freely secret-

ing pus, instrumentation is, of course, out of the question. Dilatations should not be started until the urine is clear and contains only shreds.

It makes no difference, as far as treatment is concerned, whether the submucous round cell infiltration is soft and recent or whether it has been transformed into scar tissue; the indications in either case are to promote its absorption by dilatation and pressure. Cases in which a considerable surface of mucous membrane is involved are unsuitable for dilatation until the catarrh has been checked by irrigations, and the superficial process has been localized in a few spots in the urethra, as denoted by shreds floating in clear urine.

GLANDULAR URETHRITIS

Many intractable cases of gonorrhea lasting for years in spite of constant treatment are caused by a chronic inflammation of Morgagni's crypts. Such cases show few symptoms, the morning drop at the meatus being the most constant. But they are characterized by exacerbations of the discharge after slight provocation, with a free discharge of pus containing gonococci, which leads the patient to believe that he has acquired a fresh infection. Urethroscopic examination shows the mouths of a few of the crypts

to be open and pouting, with red and slightly elevated edges. In other cases the mouths of the crypts are occluded by a growth of epithelium. When the crypts are affected the gonococci may remain in them for years and the case remain infectious.

These cases should be treated by dilatations with full sized sounds followed by irrigations. When the mouths of the glands are occluded by the growth of epithelium, dilatation of the urethra opens them and forces out the purulent secretion. The irrigating fluid enters the cavities and acts on the chronic inflammatory processes within the glands. In that form of inflammation in which the mouths of the glands are held open and the entire crypt is stiffened and inelastic from the periglandular infiltration, dilatations cause the absorption of the infiltrate around the glands and promote a return to normal condition.

When, after sufficient treatment by dilatations and irrigations, it is found by urethroscopic examination that a few glands still remain chronically inflamed and suppurating, and are thus foci of infection, these should be destroyed. This can be accomplished by bringing them into view with the urethroscope, and introducing a galvanocaustic needle. The cauterization must be very superficial and rapid; otherwise there will be danger of stricture formation. Not more

than three or four crypts may be destroyed at a sitting. It is possible by destroying the glands harboring the gonococci to cure in this way a chronic gonorrhea of years' standing which has resisted all the other usual forms of treatment.

CHRONIC POSTERIOR URETHRITIS

Acute posterior urethritis may recover without becoming chronic; more frequently it passes into a chronic stage analogous in its pathologic changes to those of chronic anterior urethritis. In chronic posterior urethritis due to gonorrhea, the prostate and seminal vesicles are usually involved. Acute posterior urethritis is invariably caused by the gonococcus, but chronic posterior urethritis is produced by other causes, among which are excessive sexual intercourse, masturbation, or perineal traumatism, as from horseback riding.

DIAGNOSIS

A history of uncured gonorrhea or sexual abuse, especially when accompanied by the symptoms of sexual neurasthenia, prostatorrhea, and urinary and sexual disturbances, point to chronic posterior urethritis. Examination is necessary to confirm the diagnosis. The two-glass urine test is useful only in the event of a considerable amount of pus formation, in which cases Glasses 1 and 2 are turbid, and contain small shreds like commas from the mouths of the prostatic

ducts, the so-called "Furbinger's" hooks. When the secretion of the posterior urethra is scanty the diagnosis should be confirmed by examination with the posterior urethroscope. The posterior urethra is found to be purple, bleeding freely, and may be the seat of granulations. The colliculus is swollen and edematous, filling the end of the tube, and bright red or bluish, and small polypi are often noted growing on its surface. In time the submucous infiltration becomes converted into connective tissue, and the colliculus is flat, irregular and grayish white.

TREATMENT

In the presence of free pus formation, urethrovesical irrigations by the gravity method with a solution of silver nitrate from 1 : 10,000 to 1 : 4,000 or potassium permanganate, 1 : 3,000, is the best method of rapidly reducing the purulent discharge. After the urethra becomes clear, the prostate and vesicles should be examined, and if found to be diseased must be massaged in connection with the irrigation. When the urethroscope shows the infiltrated changes localized to the colliculus, direct applications of from 10 to 20 per cent. silver nitrate solution should be made once a week through the endoscope. Granulations in the

posterior urethra should be treated by cauterizing with strong silver nitrate solution. Small polypi, or granulations on the colliculus may be removed by scissors, forceps or a galvanocaustic point. If the utricle is infected it should be injected with silver nitrate solution with a small syringe.

Chronic Prostatitis.—In almost every case of chronic gonorrheal urethritis the prostate is involved. Chronic prostatitis usually originates in an attack of acute prostatitis, but it may result from a slow, insidious extension through the prostatic ducts of an infection from the posterior urethra. Aside from its frequency, chronic prostatitis is perhaps the most important complication of gonorrhea, for the reason that the gonococcus, with all its infectious qualities unimpaired, may be retained for years in the diseased tubular glands of the prostate without its presence being suspected. Probably most of the cases in which wives are infected with gonorrhea by their husbands come from uncured prostatitis. Chronic prostatitis is also important on account of the profound disturbance of the nervous system and the impairment of the sexual function, which it occasionally produces.

The first indication in the treatment of chronic prostatitis is to improve the general condition of the

patient by a proper regimen. Constipation is generally a prominent symptom, which is best treated with saline cathartics, because they have some effect in relieving pelvic congestion. All sorts of erotic excitement should be interdicted on account of their effect in inducing congestion of the prostate. Coitus should not be permitted, both because of its ill effect on the diseased prostate and because of the certainty of spreading the infection.

The most effective local measure is the emptying of the prostatic tubules of their retained and thickened contents by rectal massage two or three times weekly. In this procedure both lobes should be massaged from above downward and the manipulation should not be very vigorous, the object being to force out the prostatic contents by moderate pressure. Massage of the prostate is not well borne by all patients; and, if it produces irritating symptoms, it should not be persisted in. In order to lessen the danger of epididymitis from prostatic massage, it is advisable to irrigate the urethra and fill the bladder before massage with a solution of silver nitrate from 1 : 10,000 to 1 : 4,000 or potassium permanganate 1 : 3,000.

Treatment by massage and irrigation should be persisted in for from six to eight weeks, or until a

microscopic examination of the expressed prostatic secretion shows only a small number of pus cells in the field. Many cases will be found to improve under massage up to a certain point and then remain stationary. In such instances it is advisable to stop treatment for a month. If after this intermission the remaining evidences of prostatitis have not disappeared, another course of massage may be given. Such treatment should be repeated until the pus cells in the expressed prostatic secretion are found on microscopic examination to be only from four to six in a field, and lecithin bodies are abundant.

While treating chronic prostatitis, it is important not to overlook the chronic posterior urethritis which nearly always accompanies it. This should be treated by irrigation, dilatation, and other measures, as already described.

Chronic Seminal Vesiculitis. — Chronic vesiculitis may originate from an acute attack of vesiculitis which does not undergo resolution; but as a rule it develops insidiously, as the result of the extension of a chronic inflammatory process which begins in the posterior urethra and extends through the ejaculatory duct. The ejaculatory duct is never occluded by the changes; throughout the whole course of the disease

it remains patulous, and sterility does not occur from this cause.

Chronic seminal vesiculitis presents itself in two varieties:

1. Atonic vesiculitis, in which there is chiefly an atony of the muscular fibers composing the walls of the vesicle.

2. Inflammatory vesiculitis, in which the walls of the vesicles are thickened and indurated as a result of inflammation, which may be simple, gonorrheal, or tuberculous in origin.

Either form of vesiculitis may exist by itself; but usually there is a combination of atony and inflammation of the vesicular walls.

Treatment.—The treatment consists in massaging and expressing the contents of the vesicles twice a week. Massaging empties the vesicles of their inspissated contents, without forcing the muscular fibers to contract; and, by the relief of distention and the rest thus afforded them, the muscles recover their tone.

Contraindications to massaging are: (*a*) the existence of acute vesiculitis; (*b*) blood in the expressed material, or (*c*) excessive tenderness. With these conditions present, there is always danger of setting up an epididymitis.

In chronic vesiculitis the posterior urethra should not be overlooked, but should receive treatment, with irrigations or instillations or by applications made through the urethroscope as outlined under chronic posterior urethritis. It is desirable not to apply local treatment to the posterior urethra and massage the vesicles at the same sitting, but rather to allow a couple of days to intervene.

The duration of treatment must be protracted, for it requires from two to twelve months to effect a cure. In obstinate cases characterized by marked sexual neurasthenia or intractable gonorrheal rheumatism, free incision into and drainage of the seminal vesicles may be demanded. This is a procedure requiring expert skill.

CURE

Under treatment, as outlined above, cure can be obtained in practically all cases of gonorrhea. If, under such treatment, symptoms persist beyond a reasonable time in chronic cases, it is an evidence that some focus of infection persists which has been overlooked; and these cases should be carefully reexamined by an expert urologist. It may not be possible to cause the entire cessation of mucopurulent discharge from the meatus or the disappearance of all shreds from the urine, while treatment is continued;

for this in itself may produce sufficient irritation to keep up a degree of inflammation of the urethral mucosa. If gonococci are absent, it is proper, in estimating the situation in a case, to disregard light filaments in the urine and a slight mucoid discharge from the meatus, and confidently to expect that these will disappear spontaneously with the cessation of treatment.

TEST OF CURE OF GONORRHEA

The man should take vigorous exercise on the day before the one on which the examination is to be made.

He should not urinate for two hours before the examination is made.

Examination should show the following findings:

1. He should have no uretheral discharge.
2. If a drop is found, it must be free from gonococci.
3. In the two-glass test, both Glass 1 and Glass 2 must be clear and free from pus shreds. Epithelial shreds free from gonococci may be disregarded.
4. The secretion obtained by massage of the prostate and seminal vesicles must show no gonococci and few leukocytes.
5. Examination with a bougie à boule should demonstrate the absence of stricture.

GONORRHEAL RHEUMATISM AND METASTATIC GONORRHEA

Infections of Synovial Membranes.—The most frequent metastasis of the gonococcus is seen in the infec-

tion of the synovial membranes, which usually develops in the third week of the disease, after involvement of the posterior urethra. Traumatism may be a predisposing factor. Gonorrheal rheumatism is an inflammation of one or more joints caused by the deposit of gonococci carried to the synovial membranes through the blood current. Three forms may be distinguished: (1) a hydrarthrosis usually confined to a single joint (monarticular), generally the knee; (2) an arthritis resembling ordinary rheumatism, as it begins with fever and involves several joints, and (3) an inflammation of the synovial sheaths of tendons and muscles and the bursae, which become seats of chronic inflammatory changes—the joints may be involved or they may escape. The course of all these forms is very slow.

Should gonorrheal rheumatism develop, it is important promptly to begin active treatment; for it is a serious complication, and if not treated energetically at first it becomes chronic and very difficult to cure. Pericarditis and endocarditis may arise; ulcerations of the valves may take place, and vegetations containing gonococci may form on them. Early advice from an expert orthopedist should be sought. It is essential to continue to treat the gonorrhea, which has become chronic and which frequently has involved the prostate

and the seminal vesicles. The presence of a chronic vesiculitis that does not respond to treatment by massage requires a seminal vesiculotomy with drainage in order to stop further absorption of the toxin. Gonorrheal vaccines are useful in some cases.

SUMMARY OF MANAGEMENT OF GONORRHEA

A. Keep the urethra free from the products of inflammation in:

1. Acute gonorrhea by:
   - (*a*) Ingesting so large quantities of water as to cause frequent urination.
   - (*b*) Immersing the penis in water as hot as can be borne for from five to ten minutes three times a day.
2. Chronic gonorrhea by:
   - (*a*) Emptying the prostate and the seminal vesicles of inflammatory products and improving the circulation of blood in these organs.
   - (*b*) Causing the absorption of submucous infiltration.
   - (*c*) Healing erosions of the mucous membrane.

B. Apply antiseptics frequently in order to destroy the organisms in:

1. Acute gonorrhea by:
   - (*a*) Injections, hand, mild, at frequent intervals.
   - (*b*) Administration of selected drugs by mouth.
2. Chronic gonorrhea by:
   - (*a*) Irrigations, mild, at frequent intervals.
   - (*b*) Administration of selected drugs by mouth.

D. Individualize management in:
  1. Hospitals by having:
    (*a*) Separate toilets for
      (1) Gonorrheics.
      (2) Syphilitics.
    (*b*) Separate wards or sections of a ward for:
      (1) Gonorrheics.
      (2) Syphilitics.
    (*c*) Ward equipment marked so as to be used only by patient occupying correspondingly numbered bed.
      1. Patients':
        (*a*) Dishes and toilet accessories to have bed number placed on each article by stamp, paint or otherwise
        (*b*) Thermometers.
          1. One for each patient, to be kept, if possible, in a test tube in a solution of phenol or other antiseptic.
      2. Linen, utensils and instruments:
        (*a*) Appropriately marked, and
        (*b*) Used in wards and on beds as marked.

E. Disinfect and sterilize:
  1. Latrines and toilets by having:
    (*a*) Seats and bowls washed twice a day with:
      (1) Hot soapsuds, and a
      (2) Solution of mercuric chlorid, 1 : 1,000.

2. Instruments and supplies by having:
   (*a*) Bed linen, towels and washable clothing and other articles steam sterilized before laundering.
   (*b*) Metal, glass and rubber sterilized in
      (1) Boiling water, or
      (2) Steam.
   (*c*) Silk and linen bougies and catheters sterilized by
      (1) Washing with soap and water after using.
      (2) Immersing in solution of mercuric chlorid, 1 : 1,000, and
      (3) Rinsing with sterile water before using.

PATIENTS

1. Make a Wassermann blood serum test on all.
2. Treat no venereal sore until the presence of syphilis has been positively excluded.
3. If dentistry is required, send to dental surgeon *with the diagnosis.*
4. Allow light exercise when:
   (*a*) Urethral discharge is mucopurulent, scanty and free from gonococci.
   (*b*) Urine is clear, disregarding epithelial shreds.
   (*c*) No gonococci are found in the expressed secretion of prostate and seminal vesicles.
5. Send to bed in the hospital on the occurrence of:
   (*a*) Acute symptoms.
   (*b*) Need for surgical interference.
6. Diet to be light and bland until otherwise ordered.
7. Ambulatory cases to wear suspensory.

CLASSIFICATION

1. *Acute Gonorrhea.*—Fresh infection.
   (*a*) Hyperacute — inflammatory symptoms excessive, marked edema, chordee, burning urination.
   (*b*) Moderately severe.
   (*c*) Mild.
2. *Chronic Gonorrhea.*
3. *Complications.*
   (*a*) Prostatitis:
      1. Acute.
      2. Chronic.
      3. Abscess.
   (*b*) Infiltrations and strictures:
      1. Hard.
      2. Soft.
   (*c*) Vesiculitis:
      1. Acute.
      2. Chronic.
   (*d*) Epididymitis.
   (*e*) Arthritis.
   (*f*) Conjunctivitis.

METHODS

1. Examination of patient:
   (*a*) Acute gonorrhea:
      1. History taken on admission.
      2. Inspection of the external genitals.
      3. Urethral smears to be prepared, studied and recorded.
   (*b*) Chronic gonorrhea:
      1. History taken on admission.
      2. Inspection of the external genitals.

3. Urethral smears prepared, studied and recorded.
4. Two-glass urine test; urine sedimented; sediment examined and recorded.
5. Prostate and seminal vesicles palpated; expressed material collected for examination, study and report.
6. Bougie à boule passed for stricture when indicated.
7. Endoscopy performed when indicated.

2. Water administration in:

(*a*) Acute gonorrhea:

A glassful every hour throughout the day; as often as awake at night.

(*b*) Chronic gonorrhea:

A glassful every hour throughout the day; as desired at night.

3. Urination in:

(*a*) Acute gonorrhea:

1. Bed urinals always at bedside.
2. Patient to make effort to pass urine hourly during day; as often as awake at night.

4. Hand injections:

Bed patients:

1. Hyperacute type: *none.*
2. Moderately severe type: every two hours or after each act of urination, if irritation is not produced by so doing
3. Mild type: every two hours or after each act of urination.

5. Irrigations:
   (*a*) Urethra:
      1. Acute and chronic gonorrhea.
      2. Gravity method: every second day.
      3. Catheter, not over 16 French: when gravity method is painful or difficult.
   (*b*) Bladder:
      1. Gravity method: when massaged or instrumented.
      2. Catheter.

      Fill and empty two to three times; allow about 2 ounces to remain in bladder.
6. Massage:
   (*a*) Prostate and seminal vesicles:
      1. Chronic cases and complications:
         (*a*) Two or three times a week.
   (*b*) Urethra over sound:
      1. Every other day to twice a week.
   (*c*) Follow with urethrovesical irrigation.
   (*d*) No massage on the same day that dilatation is performed.
7. Dilatation of urethra for:
   (*a*) Strictures by:
      1. Sounds; meatotomy when necessary.
      2. Bougies, soft.
      3. Dilators.
   (*b*) Follow with urethrovesical irrigation.
   (*c*) No dilatation on the same day that massage is performed.

DRUGS AND SOLUTIONS

1. Sandalwood oil:
   (*a*) Dose, from 0.50 to 1.00 c.c. (8 to 15 minims) in capsules.
   (*b*) Intervals, three times a day after meals.
   (*c*) Discontinue administration if it causes indigestion or an intense pain in back.
   (*d*) Give in:
      1. Hyperacute type.
      2. Moderately severe type.
      3. Painful urination cases.

2. Potassium permanganate:
   (*a*) Aqueous solution, strength from 1:5,000 to 1:3,000, determined by reaction of the mucous membrane.
   (*b*) Use:
      (*a*) Fomentation to penis in hyperacute cases.
      (*b*) Irrigation of urethra and bladder.

3. Silver:
   (*a*) Nitrate:
      1. Aqueous solution.
      2. Strength: from 1:10,000 to 1:5,000, determined by reaction of the mucous membrane.
      3. Use: urethral and vesical irrigation.
   (*b*) Argyrol or equivalent:
      1. Aqueous solution.
      2. Strength: from 3 to 5 per cent., determined by reaction of the mucous membrane.
      3. Dose: 5 c.c. of the solution.
      4. Interval: every two hours during day, twice at night.
      5. Use: urethral injection.

(*c*) Protargol or equivalent:
1. Solution in water.
2. Strength: from 0.25 to 0.5 per cent., determined by reaction of the mucous membrane.
3. Dose: 5 c.c. of the solution.
4. Interval: every two hours during day, twice at night.
5. Used as urethral injection.

TREATMENT

1. Acute gonorrhea:
   (*a*) Hyperacute.
      1. Confine to bed.
      2. *No injections* until all hyperacute symptoms subside.
      3. Sandalwood oil by mouth.
      4. Hot fomentations to genitals.
   (*b*) Moderately severe.
      1. Confine to bed.
      2. Hand injections, retained five minutes or more.
         (*a*) After urination.
         (*b*) Every two hours during day until 8 p. m. and at 11 p. m. and 3 a. m.
2. Chronic gonorrheas:
      1. Massage prostate and seminal vesicles:
         (*a*) Every other day to twice a week while some urine is present in bladder.
         (*b*) Examine fluid expressed by massage for gonococci.
         (*c*) Examine sediment of urine collected immediately after massage
      2. Irrigation:
         (*a*) Urethrovesical.
            1. Fill and empty bladder two or three times.

2. Allow about 2 ounces to remain in bladder.

(*b*) Every other day to twice a week.

3. Complications:

(*a*) Prostate.

1. Acute prostatitis: See treatment of.
2. Chronic prostatitis: See treatment of.
3. Abscess: operation at hospital.

(*b*) Seminal vesicles:

1. Acute vesiculitis: See treatment of.
2. Chronic vesiculitis: See treatment of.

(*c*) Epididymitis: See treatment of.

1. Expectant:
   (*a*) Stop all urethral treatment.
   (*b*) Suspend testicles.
2. Operation — epididymotomy.

(*d*) Cowper's glands: See treatment of.

(*e*) Urethral glands: See treatment of.

(*f*) Synovial membranes: See treatment of.

(*g*) Eyes:

1. Conjunctivitis: Refer to ophthalmologist immediately.
2. Keep up treatment of urethra and adnexa.

(*h*) Chordee: See treatment of.

TESTS

1. Gonorrhea positive, gonococci found in smear and by culture in:

(*a*) Urethral discharge.

(*b*) Urinary sediment after massage.

(*c*) Fluid derived from massage.

1. Prostate.
2. Seminal vesicles.

(*d*) Discharge from urethral adnexa obtained through endoscope.

2. Two-glass test:
   (*a*) Urine voided in two portions into two separate containers:
      1. One inch in first glass, about one-half to one ounce.
      2. Balance in second glass.
   (*a*) Deductions:
      1. Cloudy first glass, pus sediment; clear second glass: anterior urethra only involved.
      2. Cloudy first glass; cloudy second glass, pus sediment: posterior urethra involved.
      3. Washings from anterior urethra clear; urine in first and second glasses cloudy, pus sediment: posterior urethra alone involved.
3. Cure:
   (*a*) *No urethral discharge.*
   (*b*) Vigorous exercise to be taken the day before the test is made.
   (*c*) Urine *not* to be voided for at least two hours previous to making test.
   (*d*) Two-glass test, *both* glasses to be *free* from *pus,* epithelial filaments may be disregarded.
   (*e*) Secretions expressed from prostate and the seminal vesicles show few or no leukocytes.
   (*f*) Passage of bougie à boule demonstrates absence of stricture.

SCHEME OF EXAMINING CHRONIC GONORRHEICS

In order to standardize the method of examining cases of chronic urethritis, the following system of routine examination is recommended:

The examination and laboratory notes can be inserted in the clinical record sheets. The method and sequence of the steps of the examination are indicated as follows:

Date:
Scrotum and contents—
Urethral secretion—
Urethral sec., Microscope—
Urine; glass 1 and 2
Prostate, palpation—
Vesicles, palpation—
Exp. Secretion, Microscope—
Urethral Bougie—
Ant. Urethroscopy—
Post. Urethroscopy—
Complications.

Surname of Patient. Christian Name.

The following is a sample to show clinical record filled out with necessary clinical and laboratory data as obtained in a hypothetic case:

Date:
Scrotum and contents:
(nodule in right epididymis)
Urethral secretion:
Mucopurulent, moderate quantity.
Urethral secretion, microscope:
Pus, squamous epithelium; moderate number of intracellular gonococci.
Urines:
1. Turbid and shreds.
2. Clear.

Prostate, palpation:
Left lobe enlarged and nodular.
Right, normal in size and hard.
Vesicles, palpation:
Embedded in perivesicular infiltration.
Exp. secretion, microscope:
Moderate amount of pus; no organisms.
Urethra, Bougie à boule:
No. 24; stricture 2 inches from meatus.
Anterior urethroscopy:
Soft infiltration, going over into hard; one-half dozen Morgagni's crypts.
Posterior urethroscopy:
Bleeds freely; colliculus, greatly congested.
Complications:
Arthritis, left knee.

Surname of Patient. Christian Name.

INSTRUCTIONS

1. Smears will be made both from the urethra and prostate. One drop of the discharge should be spread over 2 cm. square of slide or portion thereof in proportion to size of drop.

2. The examination will be made after vigorous exercise on the day previous to examination, after retention of urine for at least two hours.

3. The cases will be considered noninfectious:
   (*a*) If there is no discharge from the urethra or a slight mucous discharge which is free from gonococci.

(*b*) If Glasses I and II are clear and free from pus shreds. (Epithelial filaments may be disregarded.)

(*c*) If the secretions expressed from the prostate and vesicles show no gonococci and not more than five leukocytes per field.

4. In cases of doubt where no urethral discharge is present a provocative irrigation of the urethra with silver nitrate 1 : 1,000 should be made. If gonococci are still in the tissues they will be found in the discharge which follows in a few hours, on microscopic examination.

SPECIMEN OF THE FORM TO BE USED IN MAKING REPORTS OF THE EXAMINATION OF SMEARS BY THE LABORATORY

Specimen from:

URETHRA

1. Gonococci.
   (*a*) Intracellular.
   (*b*) Extracellular.
2. Other organisms.
3. Pus.
4. Epithelium.

PROSTATE

1. Average pus cells per field.
2. Gonococci.
   (*a*) Intracellular.
   (*b*) Extracellular.
3. Other organisms.
4. Lecithin.

TREATMENT OF GONORRHEA IN WOMEN

GENERAL CONSIDERATION AND PATHOLOGY

Before taking up the detailed treatment of gonorrhea in women it seems best to briefly mention certain facts in the pathology of gonorrhea and to give certain general rules regarding treatment in order that repetition may be avoided.

The pathology of this infection is in great part dependent upon the age of the patient. During menstrual life, the initial lesions are most often an endocervicitis and less commonly a urethritis; infection of the glands of the introitus are secondary and vaginitis is exceptional in this age. During this period of life, there is a probability of ascension of the infection to the uterine body and tubes. This ascension is most liable to occur during the act of menstruation, where the uterus is congested and the os dilated. It is therefore highly advisable that patients with gonorrhea remain in bed during menstruation, especially if the disease is still acute.

Before puberty and after the menopause the vaginal mucosa is not so resistant to infection, so that in these extremes of age vaginitis is the common lesion. Before puberty this vaginitis is associated with a

vulvitis, but after the menopause the vulva is not so liable to be infected as are the cervix and urethra. These cases of vaginitis are extremely resistant to treatment, as is also the endocervicitis of the atrophic uterus.

Pregnancy also alters the pathology of gonorrhea. There is commonly a vaginitis associated with marked roughening of the vaginal walls, and condylomata acuminata are prone to occur. Gonorrhea always increases the possibility of premature emptying of the uterus and vigorous treatment likewise increases the danger. Therefore, treatment must be gently applied. Douches must be of tepid water instead of hot and low pressure should be insisted on. Topical applications to the cervix had best be omitted. The excision of condylomata, the cauterization of ulcers, and the incision of vulvar abscesses may institute abortion. Any of these procedures should if possible be avoided, for it is greatly to the patient's interest that abortion should not occur during the acute stage of the disease.

Douches given during gonorrhea should not be too hot, else the damage done by the heat increase the area of involvement. A temperature of 110 degrees produces enough heat to relieve pain, dissolve secretions and improve the local circulation. Douches should be copious, six to eight quarts of water, in

order that the action time of the medication may be increased and because a prolonged irrigation relieves pain more than does a short one, and is less liable to induce bleeding. The douche should never be given under high pressure, especially during the acute stage, as it may force infection into higher regions and may produce harmful massage. Ordinarily the bottom of the douche bag should not be over a foot above the level of the hips. During the infective stage, the douches should be taken while lying on a pan, since it is dangerous to others to take it while sitting on the toilet or lying in the bath-tub. Douches should be omitted during menstruation, but, if they are given, especially low pressure should be prescribed, with a temperature between 95 and 100 degrees, so as not to increase the chances of ascending infection or hemorrhage.

No rectal examination should be made nor enemata given, because of the danger of producing a gonorrheal proctitis.

During the disease, of course, coitus should be prohibited, not only that the man may not become infected but because the resulting trauma may be absolutely dangerous, or at least delay the cure. Complete directions should be given each patient in order that others may not be innocently infected. No nurse nor

other person having to do with the care of children, who has gonorrhea, should be allowed to continue in her work because of the liability of direct implantation of the disease by the necessary attention to the toilet of children.

ACUTE CERVICITIS AND ENDOCERVICITIS

A large douche of plain hot water followed by two quarts of 1 : 2,000 silver nitrate or potassium permanganate, may be given three or four times a day during the period of profuse discharge. This water does not enter the cervical canal and kill the gonococci, but it does furnish heat of therapeutic value and cleanses the vagina of irritating discharges which tend to macerate the cervical and vaginal mucosa. By washing away the infective organisms, it also minimizes the danger of infection of the Bartholinian glands, the urethra and the peri-urethral ducts, if these are not already involved.

After douching for two weeks, the acuteness of the reaction in the cervical canal is generally so greatly reduced that topical applications may be made. At this time the cervix still gapes, but the cervical secretion has lost much of its purulent color and is more albuminous in character. After the cervical canal is swabbed as dry as possible, silver nitrate 10 per cent.

or pure tincture of iodin is applied to the lower three-quarters of an inch of the cervical canal. These applications are made twice a week until the cervix is practically free of mucus or until the cervical canal has returned to normal caliber, it being understood that the gonococci have not been found on repeated examination. Should bleeding result from these treatments, it indicates that the swabs have been introduced too deeply or that the condition is still too acute for topical application.

CHRONIC ENDOCERVICITIS AND CERVICITIS

The above outlined treatment should be carried out, increasing the strength of the topical application of silver nitrate to 20 per cent. Erosions of the cervix should be painted with this same solution. After all active evidence of inflammation has subsided, superficial cauterization of erosions may have to be performed, in order to rid a patient of an irritating discharge. When closure of the ducts of the mucous glands results in numerous *Nabothian follicles,* these are best treated by destruction with a fine-pointed electric or Paquelin cautery. This may be done in the office, care being taken not to do too much in one sitting and to allow sufficient time between treatments

for healing to occur. In aggravated cases, under special conditions, the gland-bearing portion of the cervix may be excised by operation. This, of course, would only become necessary months after the time of the acute infection.

VAGINITIS

During the acute stage, vaginitis is to be treated by douches as outlined above. Soft tampons of cotton soaked in 1 : 200 silver nitrate solution may be gently inserted in the vagina by the physician and removed by the patient after two to four hours. If too much pain results, protargol 5 per cent. or argyrol 10 per cent. may be substituted for the silver nitrate. When the edema has disappeared, topical applications may be made directly to the vaginal wall. Silver nitrate 10 per cent. is painted over the cervix and the vaginal wall in its entirety, care being taken not to let an excess of silver nitrate run down upon the vulva. It is well to insert a pledget of cotton just inside the vaginal entrance immediately after this treatment; this may be removed by the patient just before the next douche. If stubborn spots or ulcers persist, the cautery should be lightly applied. Condylomata are best removed by the galvanocautery, a few at a time, unless the patient is to remain in bed under attention.

VULVITIS

Rarely does a vulvitis exist without disease farther up the genital canal, but, if it does, care should be exercised not to spread the infection upward. During the acute stage, rest in bed is usually required by the patient's discomfort. Acetylsalicylic acid or pyramidon is generally sufficient to control the pain. An ointment of protargol 5 per cent., spread on gauze, may be applied to the vulva, and if itching is present, ½ per cent. phenol is added to the ointment.

In chronic cases, the infected Bartholinian and paraurethral ducts are to be injected through a blunt hypodermic needle with 10 to 20 per cent. silver nitrate and the vulva painted with 2 to 5 per cent. solution.

BARTHOLINITIS

Hot applications should be made during the acute stage of a bartholinitis; and rest in bed with sedatives is to be prescribed for pain. Just as soon as an abscess has formed it should be incised and drained and only if drainage persists or exacerbations occur should the gland be removed. A cystic or chronically infected gland should always be excised instead of drained, but considerable danger attends the practice of removing by dissection acutely inflamed glands.

URETHRITIS

This is not always present in gonorrhea in the female and many cases run their entire course without any urinary disturbance. When present it is frequently of short duration, not very distressing and cures itself spontaneously. The burning on urination may be lessened by sandal oil and by copious drinking of fluids, and the attack may be shortened by acidification of the urine, and hexamethylenamin, a dram a day in divided doses. When the genital tract is invaded, as it usually is, the prolonged hot douches advised elsewhere furnish much relief from the pain.

In subacute cases, bougies three quarters of an inch long, of 10 per cent. argyrol or 5 per cent. protargol in cocoa butter, may be inserted by the physician and the patient instructed in this insertion. These bougies should be inserted after urination and held in position until they tend not to escape.

In chronic cases, the urethra may be lightly massaged before urination; this tends to empty the crypts along the urethral canal and hastens the absorption of inflammatory deposits. If this massage is followed by an exacerbation of symptoms, it has been begun too early. In stubborn cases, an endoscope should be inserted, and silver nitrate 10 per cent. be lightly applied to the inflamed areas; this failing, a sound

just large enough to distend the urethra should be coated with protargol ointment 10 per cent. and inserted, and light massage of the urethra carried on; this is done twice a week. The bladder should be full during this treatment and then emptied immediately. Stricture of the urethra is a rare complication, but should be suspected in cases with recurrent symptoms, especially if associated with difficulty in urination. The treatment of stricture is the same as in the male, but is much more readily performed.

If Skene's or the para-urethral ducts remain infected, recurring difficulty may be expected. If injection of 10 per cent. silver nitrate through a blunt hypodermic needle does not perfect a rapid cure, then with a probe as a guide, a galvanocautery should be used to destroy the crypts in their entirety.

CYSTITIS

Cystitis in the female is not existent as often as treated; but when actually demonstrated to be present, the treatment is the same as in the male.

METRITIS AND ENDOMETRITIS

During the acute stage, rest in bed is strictly advised. Hot or cold applications over the lower abdomen are to be given for the relief of pain.

Acetylsalicylic acid (aspirin) and pyramidon or other analgesics may be prescribed, but rarely are opiates necessary. When extreme pain is present, it generally indicates that tubal involvement has already occurred. Hot douches, as advised in endocervicitis, are to be ordered, but local applications are absolutely inadvisable and dangerous during the acute stage. In the event of menstruation occurring during the acute stage, ergot should be given in order to diminish bleeding.

When the disease has become chronic in the uterus, treatment depends upon symptomatology. The knowledge that gonorrhea has existed does not indicate treatment. If menorrhagia occurs and is not brought under control by a prolonged course of hot douches and ergot, a curettage followed by a liberal intrauterine application of tincture of iodin is indicated. If tubal involvement is also present, curettement is not to be performed, unless at the same time surgery for the relief of the tubal condition is to be carried out. Hemorrhage is the only indication for a curettage. It is not to be performed with the idea of cleansing the uterus of gonorrheal disease; if gonococci can be demonstrated in the cervical discharge, a curettage can only harm the patient.

A leukorrhea of gonorrheal origin indicates that the chief infection lies in the cervical canal and a curettage would only make the patient worse. Intrauterine applications of caustics or other destructive agents are unsurgical and provocative of harm. Time is an important factor, since many cases of uterine infection progress to a cure despite unsuccessful treatment. Many cases may require surgery, but time is of first importance.

SALPINGITIS AND OVARITIS

Absolute rest in bed and quiet are the principal therapeutic agents during the acute stage. Although pyramidon and acetylsalicylic acid help greatly in the control of the pain, which is severe, opiates are usually necessary to supplement their action. The bowels should be moved by laxatives instead of enemas because of the danger of proctitis, and because harmful pressure on incompletely closed tubes may lead to a leakage of pus. The practice of purging such patients is harmful, since it disturbs rest, increases pressure and weakens the patient. Examinations should be very gently performed and limited to absolute necessity, since exacerbations in temperature and pain frequently follow them. Douches given during the acute stage are more often followed by harm than by good and should be

held in abeyance until adhesions are surely strong and resistant.

Abundant easily digested food is necessary, if food is tolerated; the appetite should be encouraged, and better sleep induced.

The onset of the infection is usually stormy, but improvement occurs rapidly; the fever tends to decrease after three or four days and the pain lessens. If at the end of a week the fever remains high and pain persists, there may be found definite palpable swellings of the appendages. If the patient is not improving, these swellings should be drained vaginally, care being taken not to traverse the peritoneal cavity. The early drainage of pus allows early resolution and limits the destruction of tissue. Cases so drained are less often in need of subsequent surgery, and more frequently progress to a complete anatomical cure. Of course, cases which are getting well without surgery should be let alone. Abdominal surgery is too often done during the acute and subacute stages of the disease. The patients run more danger from these operations than they do from the disease, since general peritonitis is a rare complication of gonorrheal salpingitis and is too often a termination of these operations.

If the pain and swellings persist after the temperature has subsided, then douches should be given. Icthyol 5 per cent. in glycerin applied on tampons in the vault of the vagina is a valuable agent in hastening resolution in the inflamed appendages.

If pain persists after leukocytosis has disappeared, much relief can be had by the use of dry heating of the pelvic region by some of the various special cabinets arranged for this purpose.

As long as progressive improvement occurs the patient should not be operated on and the practice of operating on such patients because they have abnormal anatomy should be discouraged. It frequently happens that even big bilateral swellings not only progress to an anatomical cure, i. e., disappearance of the swellings and a return of the organs to normal palpatory findings, but also to a physiological cure as shown by the occurrence of pregnancy. Where exacerbations of acute difficulty occur or where there is an important residue of pain or menorrhagia after weeks or months have elapsed, and where these conditions are more appropriately treated by surgical measures, their further treatment is by direct surgical attack, which must be conducted by a trained surgeon.

APPENDIX

WAR PROGRAM OF THE SURGEON-GENERAL OF THE ARMY FOR COMBATING VENEREAL DISEASES

The following program is the working plan under which the activities of the Surgeon-General's Office for attacking venereal diseases have been coordinated and developed. Eighteen months' experience with it during the war has proved its value and practicability.

PROGRAM OF ATTACK ON VENEREAL DISEASES

AN OUTLINE OF ACTIVITIES AND COOPERATING AGENCIES PLANNED TO REDUCE THE PREVALENCE OF THE VENEREAL DISEASES

Methods of attack on venereal diseases divide themselves into four classes:

A. Social measures to diminish sexual temptations.

B. Education of soldiers and civilians in regard to venereal diseases.

C. Prophylactic measures against venereal diseases.

D. Medical care.

A. SOCIAL MEASURES TO DIMINISH SEXUAL TEMPTATIONS

(1) The suppression of prostitution and the liquor traffic.

(2) Provision of proper social surroundings and recreation.

These activities which have to do with social matters largely fall outside the jurisdiction of the medical service of the Army, but this service can render these activities more efficient by stimulating and supporting them, and wherever practicable such support should be given.

(1) Suppression of prostitution and liquor traffic in zones.

Keep careful track of conditions as regards these two matters in surrounding districts, in cities or towns where soldiers go, and in travel gateways.

In camps and zones, we have the following agencies which may be utilized:

The constituted authorities, military and civil.

The Commission on Training Camp Activities, War Department.

Local and national volunteer agencies may be utilized to discover failures and abuses, and to help otherwise in the work under direction of the proper authorities.

Outside the zones, a large number of forces can be used. Among these:

State Councils of National Defense.

Civil, police and health administrations.

Associations of commerce.

Women's clubs.

The press.

Social hygiene and vigilance societies, and other social and religious organizations of influence in civil communities.

(2) *Provision of proper social surroundings and recreation.*

In camps and zones, plan to:

Develop social activities and amusements.

Provide places where soldiers may go for comradeship, to meet friends, to "loaf."

Supply an attractive place, or places, for soldiers to meet their women callers in camps and near camps.

Establish, under police authority, women patrols in zones.

Enforce rules against women being received in soldiers' tents or being allowed the freedom of camps.

Encourage facilities for interesting the soldier in reading, lectures, music, congenial friendships, hobbies.

For this purpose, we have for use in camps or zones, or both:

The Commission on Training Camp Activities, supervising activities of the Young Men's Christian Association, Playground and Recreation Association,

Knights of Columbus, Young Women's Christian Association through its hostess houses, the American Social Hygiene Association, and other national and local organizations invited to carry on special activities.

Similar provisions for social diversions and proper social surroundings should be provided outside the zones, and if possible, provision at least for their inspection by military inspectors should be provided.

For use outside the zones, we have practically all the above agencies which are organized to conduct similar work in communities accessible to soldiers but not within the military zones.

An effort should be made to stimulate local organizations in towns near camps and at railroad centers to furnish proper social diversions and amusements for soldiers, and to provide places where they may go when on leave.

Enlisted men's clubs for this purpose, perhaps charging a small fee, say 25 cents monthly membership, are greatly to be desired.

Organizations of men and mature women to furnish members to meet soldiers in a friendly way, and to give them information and directions are desirable in towns and at railroad centers and other points in large cities where soldiers come in numbers. Fraternal organizations should be enlisted in this work.

Pressure should be brought to bear on the civil authorities to suppress vicious amusement places, to clean up parks and other recreation places, and to furnish for such places morals police. For this purpose, the members of special law enforcement organizations can be used.

Inspection of social and moral conditions in the camps, in the zones, and in contiguous districts and of the work being done by the various agencies for social betterment should be made by federal authorities. Similar volunteer inspections by dependable vigilance and other civic associations should be encouraged.

B. EDUCATION OF SOLDIERS AND CIVILIANS

(1) *For Soldiers:* (*a*) *Lectures;* (*b*) *Pamphlets;* (*c*) *Exhibits.*

(*a*) Lectures to soldiers should be given by medical and line officers and by competent volunteers furnished by outside agencies, under invitation and direction of the Medical Department. These, besides inculcating continence, should explain the risk and waste of venereal diseases and the program adopted to avoid them. Lectures without authority should not be permitted.

(*b*) A pamphlet should be given the soldier as soon as possible after enlistment. This pamphlet should be very brief and should warn the soldier of the venereal dangers to which he may be exposed, and give instructions, if he should be exposed, to report as promptly as possible to his regimental infirmary. It would be very desirable if a pamphlet could be distributed at the place of meeting of Exemption Boards. Later somewhat fuller pamphlets should be distributed to soldiers through medical and line officers, or by accredited volunteer social hygiene societies.

(*c*) Exhibits, such as the Coney Island exhibit of the New York Society of Social Hygiene, the exhibit of the National Cash Register Company, the exhibits of the Oregon Social Hygiene Society, the Missouri Society and other exhibits and demonstration methods

worked out by the American Social Hygiene Association should be adapted to the needs of military life and furnished to each cantonment.

(2) *For Civilians:*

In the attack on the venereal problem, it is highly desirable that such educational activities as those outlined above for soldiers should be stimulated for the civilian population.

The influence of the military authorities should be given to the national organizations for social hygiene and to the numerous sanely conducted local organizations of the same sort.

Encouragement should be given to the organizations which are undertaking to arouse the interest of the woman population of the country in matters of social hygiene and for instructing women in regard to venereal diseases.

Organizations dealing with these matters which attempt to reach women should be encouraged, especially in the vicinity of camps. An increasing number of influential organizations, such as the General Federation of Women's Clubs and Patriotic Women's League, are indorsing and supporting sound social hygiene programs, and supplementing the more specialized efforts of such organizations as the Young Women's Christian Association and the Women's Christian Temperance Union.

C. PROPHYLACTIC MEASURES

Instruction in Prophylaxis:

Soldiers should be informed of the fact that there are prophylactic measures that reduce the dangers of

venereal infection. But this instruction should take particular care to inform them that there are limitations to such prophylactic measures and that they furnish only partial protection and in no sense give freedom from risk.

Regimental Infirmaries:

The provision of prophylaxis (early treatment) in regimental infirmaries, which should be open day and night, is imperative in any sane attack on venereal diseases. The prophylactic station should be utilized as a place for personal advice and education against future exposure, and should be conducted as an early treatment dispensary. Any spirit of levity or condoning sexual promiscuity should be discouraged, and obscene stories or objectionable conduct should be rigidly repressed. The men assigned as officers in charge of these stations should be mature and with the personality and force of character calculated to gain the confidence and respect of the men applying for treatment. The medical officer in command should be impressed with the strategic importance of the prophylactic station for education, appeal, and the securing of social facts of vital importance in the prevention of venereal diseases.

Infirmaries in Civil Centers:

In cities, where there are no adequate civil dispensaries to be used and through which soldiers in considerable numbers pass, either while on leave or in travel, there should be provided in accessible locations regimental infirmaries. In a few cities, where dispensary services are particularly well developed, regimental infirmaries may be replaced to advantage by accredit-

ing these civil dispensaries for use. Information should be furnished to soldiers of the existence and location of such regimental infirmaries and available dispensaries.

Leaves of Absence. In the interest of health, long leaves of absence for soldiers should as far as possible be discouraged. Leaves of absence of more than twenty-four hours are particularly dangerous, and it would be desirable if leaves of absence should be timed from as early an hour in the day as possible.

In cases where soldiers have been exposed, particularly if for any reason exposure seems unusually dangerous, special observation of such exposed men should be made, and if practicable these observations should be repeated at intervals of a couple of days for two or three weeks.

All pressure possible should be made by military authorities against houses or women which experience shows are frequent sources of infection, and this should be extended as far as practical to prostitution generally. The more effective the repression of prostitution can be made the greater will be the reduction in venereal diseases.

All possible influences should be brought to bear to encourage civil authorities in the attack on prostitution in all its phases. A medical program for civil communities equivalent to the military program for prevention and treatment should be encouraged.

D. MEDICAL CARE

Hospital Organization:

There should be a special service in each cantonment hospital to care for skin and venereal diseases.

As far as possible, all such cases should be in charge of the venereal service, and where, for any special reasons, such cases must be under other services, the senior officer of the venereal services should be, if possible, consulted in regard to them.

In the venereal disease service, there should be at the head an experienced specialist in these diseases, and whenever possible another medical officer trained in venereal diseases should also be in the service. The other medical officers assigned to the service need not necessarily at the beginning be trained in venereal diseases.

In the event that mature specialists from the Medical Officers' Reserve Corps cannot be furnished for the head of the service in each one of the cantonment hospitals, it would be practicable to use two half-time men, serving on alternate days, to act as head of this service, these men to be obtained from adjacent large cities. Under such conditions, there should always be furnished a qualified junior officer.

Instruction in Venereal Disease for Medical Officers:

One of the important functions of these services will be to train a group of men in venereal diseases. The service will, if well conducted, rapidly develop the knowledge of these diseases among medical officers.

It should be distinctly understood that one of the duties of the trained specialists who go into this service will be that of teachers of venereal diseases to the less well trained medical officers, and regimental officers should be encouraged to avail themselves of the opportunity for instruction furnished by these services.

Emphasis should be placed on the necessity of high standards of technic in carrying out treatment.

Hospital Cases:

The cantonment hospital should have under its care all cases of venereal diseases which are in the acute, infectious stages. These include:

All cases of acute gonorrhea.

All cases of syphilis during the early infectious stage and which have chancres, mucous patches, or condylomata.

But it should be seen to that hospitalization of venereal disease does not become an abuse which is allowed to interfere unduly with military duty.

There should be no leaves of absence for infectious venereal cases, and cases which have passed the acute infectious stage but which might become dangerous through the possible development of mucous patches or of chronic gonorrheal discharge should not be allowed leaves of absence from camp.

Standard Records:

The syphilitic register of the army should be carefully and fully kept and social facts of epidemiologic importance should be secured in every case if possible.

Standardized Treatment:

An effort should be made to standardize in a general way methods of treatment, and provision should be made for some special instructions in venereal diseases for all medical officers who have charge of troops. To this end, a manual of instructions should be issued to each of the medical officers in the army. This should especially emphasize the great importance of early diagnosis and treatment in venereal diseases and outline suitable methods of treatment.

There should be furnished cards of brief instruction to patients with gonorrhea or syphilis.

Laboratory Facilities:

Laboratory facilities are necessary:

(1) For demonstrating gonococci and other bacteria.

(2) For demonstrating spirochetes by dark field illumination.

(3) For urinalysis (which should be required once a week for every syphilitic patient under treatment).

These laboratory facilities should be in the wards of the venereal service.

(4) For Wassermann tests.

These to be in the general laboratory.

Inspections:

In order to keep up a high standard of effectiveness, there should be provision for inspection of these services by special inspectors in venereal diseases from the Surgeon-General's Office. These inspections should cover each of the four classes of attack specified.

INSTRUCTIONS FOR THOSE HAVING SYPHILIS

(*POX*)

Syphilis is a deceptive disease. Usually it is a very mild disease in its early course, giving the person afflicted with it little or no distress. Because it is so mild its victim is likely to pay little attention to it and to fail to go to the trouble to have it thoroughly treated. But in spite of its mild beginning, syphilis is one of the very serious diseases because, if it is not properly treated, it may later attack vital parts of the body and cause the greatest damage. It may produce ugly deformities; destroy health and shorten life; produce blindness and at times cause insanity. These results do not occur so often that you should become panic-stricken because you have syphilis, but they are common enough to make it necessary for your safety that you make every effort to get rid of the disease. These accidents of syphilis almost never occur in the early course of the disease. When they happen, it is usually years after infection, in cases which have not been cured.

The earlier in its course syphilis is thoroughly treated, the better are the results; it is, therefore, of the utmost importance to your future health and happiness that you should have your disease promptly and skilfully treated. If you do this, there is little danger that you will have further trouble from it; and after a few years you can marry without danger to your wife or to your future children. Your medical officers will attend to treatment of your condition, but it rests on you to do your part. Unless you cooperate and live

up to instructions, treatment cannot be carried out with the best results.

One of the difficult things about syphilis is that to cure it often requires a long time—two years or more. In two or three weeks after you begin treatment, you will not know from any symptom that you have syphilis, and you will, therefore, be tempted to neglect further treatment. This is the great mistake that many persons with syphilis make. To insure future safety, treatment must be continued long after all evidence of the disease has disappeared. For your own good, you must see to it that you do not neglect your treatment after the first few months.

Syphilis is a contagious disease, but spreads only by contact with the virus or poison. The parts of the body that most often carry the virus are the mouth and the genital organs (privates). In order not to spread the disease you must be careful in your associations with others. If you are careful, you are not dangerous to others.

Obey the Following Instructions:

If you have any sore on your genitals, no matter how small, or if you think you have syphilis, report to your medical officer. Do not under any conditions rely on the "blood medicines" that promise to eradicate syphilis, and do not be caught by advertising doctors—quacks—who try to get your money by promising to cure you quickly. Do not let druggists prescribe for you; they are not qualified to treat syphilis.

Do not hesitate to tell your doctor or dentist of your disease. Later in life if you get sick at any time, you should tell your doctors that you have had syphilis, since this fact may furnish a clue to treatment on which your cure depends.

Live temperately and sensibly. Do not go to extreme in any direction in your habits of life.

Try to get a reasonable amount of sleep—eight hours is the amount needed by the average person. And as a safeguard to others, sleep alone.

You should not smoke nor chew tobacco.

Absolutely do not use alcoholic liquors. All experience shows that drinking — even moderate drinking — is bad for syphilis.

Take good care of your teeth. Brush them two or three times a day. If they are not in good condition, have them attended to by a dentist. But when you go to him, tell him that you have syphilis.

Do not have sexual intercourse until you are told by your physician that you are no longer contagious. It will interfere with the cure of the disease, and it is criminal, for it is likely to give the disease to your wife.

You must not marry until you have the doctor's consent, which cannot be properly given until at least two years have passed after cure seems complete. If you do, you run the risk of infecting your wife and your children with syphilis.

Early in the course of syphilis, while it is contagious, the greatest danger of infecting other people is by the mouth. Because of this danger, do not kiss anybody. Particularly, do not endanger children by kissing them.

Do not allow anything that has come in contact with your lips or has been in your mouth to be left around so that anybody can use it before it has been cleaned. This applies to cups and glasses, knives, forks and spoons, pipes, cigars, tooth picks and all such things. It is better to use your own towels, brushes, comb, razor, soap, etc., though these are much less likely to contamination than objects that go in your mouth.

If you have any open sores—you will not have any after the first week or two, if you are treated—everything that comes in contact with them should be destroyed or disinfected.

To live up to these instructions will only require a little care until you get used to them; after that, it will be easy. If you do live up to them, there is a good prospect that syphilis will not do your health permanent harm nor cause injury to others; and you will have the satisfaction of knowing that, after your misfortune, you have acted the part of an honest man in your efforts to overcome it.

INSTRUCTIONS FOR THOSE HAVING GONORRHEA

Clap—a Dose—Chordee (Painful Erection)—Swollen Testicle—Gleet

Gonorrhea causes so much discomfort that, unlike syphilis, it is not apt to be overlooked or neglected in its early course; but the discomfort of gonorrhea disappears long before the disease is gone, and patients are therefore apt to discontinue treatment before they are well. In such cases, the disease persists indefinitely as a morning drop or as "gleet"; perhaps not even these symptoms may be present, and the patient may suffer no particular discomfort of any kind, and yet be exposed to serious accidents to health and be a source of danger to any woman with whom he has intercourse.

It is a great mistake to regard gonorrhea lightly. Gonorrhea may occasionally be very mild in its symptoms, but if neglected painful early complications and, later, very serious ones are likely to occur. Common early complications of gonorrhea are chordee, inflammation of the prostate and bladder, and swollen testicle. Common later complications are gonorrheal rheumatism, gonorrheal disease of the heart, and stricture. These later complications are all serious troubles. In addition to the dangers to the patient, uncured gonorrhea—which may show as a gleet or a morning drop or not at all—is as contagious as an acute gonorrhea; so that for the protection of your wife you must get well. Gonorrhea is the commonest cause of sterility and serious diseases of the pelvic organs in women.

The time to cure gonorrhea easily is early in its course. The sooner proper treatment is begun, the sooner gonorrhea can be controlled and the less likely are complications. After

gonorrhea has become chronic, its cure is extremely difficult. It is, therefore, very important that the disease should be properly treated early in its course and that the patient should cooperate with his physician in doing those things which facilitate the cure. Gonorrhea can be completely cured, but in its treatment the patient must do his part.

Obey the Following Instructions:

Persist in treatment until your doctor tells you you are cured.

Do not try to treat yourself.

Do not use a patent medicine or some "sure shot" that may stop the discharges, but will not cure you.

Do not let an advertising doctor—a quack—get your money, and do not let a drug clerk treat you.

If you have had gonorrhea and you suspect that it is not cured, report to your medical officer.

During the acute stages keep quiet, and take little exercise. As long as you have any discharge avoid violent exercise, especially dancing.

In order to avoid chordee, while the disease is acute, sleep on your side, urinate just before going to bed, and drink no water after supper.

Never "break" a chordee. To get rid of it wrap the penis in cold wet cloths or pour cold water on it.

Except at night, drink plenty of water—eight or ten glasses a day.

Do not drink any alcoholic liquors; they always make the disease worse and delay its cure. Also avoid spicy drinks, such as ginger ale.

Do not eat irritating, highly seasoned, spicy foods, such as pepper, horse radish, mustard, pickles, salt and smoked meats or fish.

Always wash your hands after handling the penis, particularly in order to protect your eyes. Gonorrhea of the eyes is very dangerous; it will produce blindness if not at once treated, and the infection is easily carried to the eyes on the fingers.

Keep your penis clean. Do not plug up the opening with cotton or wear a dressing that prevents the escape of the pus from it. Wash the penis several times daily.

Burn old dressings, or drop them into a disinfecting solution.

Never use another person's syringe or let others use yours. While you are using a syringe keep it clean by washing it in very hot water and, when you have finished with its use, destroy it.

Avoid sexual excitement. Stay away from women. Do not have intercourse. It will bring your disease back to its acute stage and it is almost sure to infect the woman. Sexual intercourse while you have gonorrhea is a criminal act.

You are likely to obey instructions while your gonorrhea is acute, because it causes so much pain. Persist in this after the pain is gone; by so doing you will prevent relapse, make your cure much easier and more certain, and expose no one else to the disease.

C0-DHY-573